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**ROBINSON BRICK COMPANY
500 SOUTH SANTA FE DRIVE
DENVER, COLORADO
SITE CLOSURE**

**SITE-SPECIFIC
REMEDiation
HEALTH AND SAFETY PLAN**

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**ROBINSON BRICK COMPANY
SITE CLOSURE
SITE-SPECIFIC HEALTH AND SAFETY PLAN**

Table of Contents

1.0	INTRODUCTION	1
1.1	<i>Objective and Purpose</i>	1
1.2	<i>Scope</i>	1
1.3	<i>Site Map</i>	1
2.0	SITE HISTORY	2
3.0	PROJECT RESPONSIBILITIES	3
3.1	<i>Project Manager</i>	3
3.2	<i>Site Manager</i>	4
3.3	<i>Site Health and Safety Officer</i>	4
3.4	<i>Contractor Superintendent</i>	5
3.5	<i>Site Personnel</i>	5
4.0	STANDARDS OF CONDUCT	7
5.0	SITE CONTROL AND FACILITIES	9
5.1	<i>Site Security</i>	9
5.2	<i>Work Zones</i>	9
5.3	<i>Buddy System</i>	11
5.4	<i>Posting</i>	12
5.5	<i>Site Communications</i>	13
5.6	<i>Site Visitors</i>	14
5.7	<i>Site Facilities</i>	15
6.0	SAFETY AND HEALTH HAZARD ASSESSMENT	16
6.1	<i>Chemical Hazards</i>	16
6.2	<i>Physical Hazards</i>	18
6.3	<i>Fire and Explosion Hazards</i>	19
6.4	<i>Radioactivity Hazards</i>	20
6.5	<i>Excavation Safety</i>	21
6.6	<i>Drilling Safety</i>	22
6.7	<i>Sampling Safety</i>	23
6.8	<i>Heat and Cold Stress</i>	23
	6.8.1 <i>Heat Stress</i>	23
	6.8.2 <i>Cold Stress</i>	28
6.9	<i>Biological Hazards</i>	31
7.0	AIR MONITORING AND SOIL SAMPLING PROGRAM	32

7.1	<i>Instrumentation</i>	32
7.2	<i>Initial Site Monitoring</i>	33
7.3	<i>Area Monitoring</i>	34
7.4	<i>Ongoing Monitoring</i>	35
7.5	<i>Personal Monitoring</i>	36
7.6	<i>Perimeter Monitoring</i>	38
7.7	<i>Soil Sampling</i>	39
8.0	HAZARD COMMUNICATION PROGRAM	40
8.1	<i>Hazard Determination</i>	40
8.2	<i>Material Safety Data Sheets</i>	40
8.3	<i>Information and Training, Non-Routine Tasks</i>	41
8.4	<i>Site Visitors</i>	41
9.0	PERSONAL PROTECTIVE EQUIPMENT	42
9.1	<i>Minimum Standards for Personal Protective Equipment</i>	43
9.2	<i>Levels of Protection</i>	43
9.3	<i>Selection of Personal Protective Equipment</i>	44
9.4	<i>Levels of Protection for Specific Site Tasks</i>	45
9.5	<i>Hot Work</i>	48
9.6	<i>Maintenance, Inspection, Storage, and Disposal</i>	49
9.7	<i>Respirator Fit Testing</i>	50
9.8	<i>Hearing Protection</i>	51
10.0	DECONTAMINATION PROCEDURES	52
10.1	<i>Designated Decontamination Areas</i>	52
10.2	<i>Personnel Decontamination Procedures</i>	53
10.3	<i>Heavy Equipment and Tool Decontamination</i>	55
10.4	<i>Decontamination Procedures for Emergency Response Actions</i>	55
10.5	<i>Disposal</i>	56
11.0	MEDICAL SURVEILLANCE PROGRAM	57
11.1	<i>Baseline or Pre-placement Examination</i>	57
11.2	<i>Periodic Monitoring</i>	58
11.3	<i>Injury, Illness, and Exposure Re-Examinations</i>	58
11.4	<i>Recordkeeping</i>	58
11.5	<i>Accident Investigation</i>	59
12.0	FIRST AID AND MEDICAL SUPPORT PLAN	60
12.1	<i>First Aid</i>	60
12.2	<i>Emergency Services</i>	60
13.0	HEARING CONSERVATION	62
14.0	PERSONNEL TRAINING PROGRAM	63

14.1	<i>Pre-Project Training</i>	63
14.2	<i>Site-Specific Training</i>	65
14.3	<i>Tailgate Safety Briefings</i>	66
14.4	<i>Recordkeeping</i>	67
15.0	HEAVY EQUIPMENT OPERATION	68
16.0	HOT WORK PROCEDURES	69
16.1	<i>Hot Work Hazards</i>	69
16.2	<i>Hot Work Permit</i>	70
16.3	<i>Safety Precautions</i>	71
16.4	<i>Personal Safety Equipment</i>	71
16.5	<i>Fire Prevention</i>	72
16.6	<i>Fire Protection</i>	72
16.7	<i>General Cutting Precautions</i>	72
16.8	<i>General Cutting Procedures</i>	73
17.0	MATERIAL HANDLING PROGRAM	76
17.1	<i>Precautions for Drum Handling</i>	76
17.2	<i>Manual Drum Handling</i>	77
17.3	<i>Mechanized Drum and Materials Handling Procedures</i>	77
18.0	RECORDKEEPING	80
19.0	EMERGENCY RESPONSE AND CONTINGENCY PLANS	81
19.1	<i>Emergency Telephone Numbers</i>	81
19.2	<i>Pre-Emergency Planning</i>	82
19.3	<i>Personnel Roles and Lines of Authority</i>	83
19.4	<i>Communications</i>	83
19.5	<i>Emergency Procedures</i>	84
19.6	<i>Fire or Explosion</i>	84
19.7	<i>Worker Injury or Illness</i>	85
19.8	<i>Chemical Releases</i>	87
19.9	<i>Severe Weather Events</i>	88
19.10	<i>Security</i>	89

Appendix A Site Map

1.0 INTRODUCTION

1.1 *Objective and Purpose*

This site-specific Health and Safety Plan has been developed to address the health and safety issues related to site remediation and closure operations at the Robinson Brick Company (ROBCO), located at 500 South Santa Fe Drive in Denver, Colorado. This plan provides the necessary information to safely complete job tasks as described in Exhibit 2 of the *ROBCO Site Purchase Agreement and Covenant Not to Sue*. This plan applies to all contractors, subcontractors, and visitors at the ROBCO site.

1.2 *Scope*

The procedures, duties and responsibilities outlined in this plan shall be in effect for the duration of heavy metal contaminated soil closure operations as described in Exhibit 2 of the *ROBCO Site Purchase Agreement and Covenant Not to Sue*. This Health & Safety Plan (H&S Plan) addresses site-specific hazards, the control of those hazards, and emergency preparedness for all site activities.

Contractors will use this H&S Plan while working on the ROBCO site, or they may supply their own plan that meets the minimum performance criteria of the ROBCO plan. Review and approval of contractor health and safety plans is required before operations commence.

This H&S Plan will be amended as necessary, and will be maintained on site at all times. This document is available upon request to all personnel on the ROBCO site. The site Health and Safety Officer is responsible for maintaining and updating this document.

1.3 *Site Map*

A map of the ROBCO site is found in Appendix A.

2.0 *SITE HISTORY*

Since the late 1800's, significant changes have occurred both in physical features and type of industrial operations conducted at the ROBCO location. This section summarizes the history of the site that is assumed to be related to the contamination present.

The Merchant's Mill Ditch (also called the Mulled Ditch or Platte and Denver Ditch) was constructed through the eastern part of the Site in the Early 1870's. The ditch transported water from the South Platte River northward approximately eight miles, then emptied back into the South Platte River near its confluence with Cherry Creek. The ditch was used until 1910, after which time it was filled. No surface evidence of the former ditch is present at the Site; however, it is suspected that the ditch was exposed in the small excavated area in the far northeastern part of the Site. Timbers and layered sediments (possibly ditch fill material) were found in the excavated pit wall, located 20 feet west of the east property boundary railroad right-of-way. Historical records show that the ditch passed under the railroad tracks and continued northward. The buildings of the National Radium Institute ("NRI") were constructed over the abandoned ditch in 1914 and 1915, several years after the ditch ceased operation. It is not certain when those portions of the ditch that lie away from the NRI buildings were filled.

The Bailey Milling, Amalgamating, and Mining Company was incorporated in 1884. By 1885, the Bailey Reduction Company was also incorporated and the Bailey Smelter had been constructed as early as 1882. The location of the smelter was only about 100 feet east of the then eastern shoreline of the South Platte river at the edge of a meander where the site of the Old Spanish or Mexican Diggings, where a minor amount of gold was recovered in 1857. The north end of the large meander of the South Platte River was also where, by 1890, water was diverted from the river into the Water Power Canal (American Water Work Company), which supplied water to Lake Archer about 1 mile to the north.

For most of its operating years, the Bailey Smelter was leased to and operated by H.A.W. Tabor as the Gold and Silver Extraction Company. The smelter processed carbonate ores from Leadville mines until the mid-1890's when operations ceased because of the "silver panic" and "mining crash" of 1893. Large quantities of waste material from the metal recovery operations were probably disposed into the nearby river channel. The Bailey Smelter was dismantled around 1900.

By 1903, the Colorado Zinc Company had constructed a mill on and just east of the site of the Bailey Smelter. By 1908, the size of the original mill building had doubled. Ore processed by this operation continued to be lead-, zinc-, and cadmium-rich carbonate ores from the Leadville area mines. The increase in size of the Colorado Zinc Company operations coincided with the progressive westward movement of the South Platte River channel. It is likely that this channel movement was partly the result of zinc mill process wastes, which were probably used as fill material. Zinc milling operations continued until about 1910. However, by 1913, when National Radium Institute first became interested in the site, the zinc mill had burned and was in ruins.

The Sutton, Steele, and Steele Mining and Milling Company ("SSS") operated a dry concentration process and custom mill from 1911 to 1917 at the far north end of the ROBCO Site. This company may have been contracted to grind radium ores before National Radium Institute grinding plant was built. Uranium oxide concentrate for the National Radium Institute was stored in SSS buildings. Waste material from SSS operations may be present as fill material in the old Merchants's Mill Ditch at the north end of the Site and on the railroad property to the northeast.

The National Radium Institute ("NRI") produced 8.5 grams of radium at the Site from 1914 to 1916. The NRI leased a portion of the Site from the adjacent Sutton, Steele, and Steele Mining and Milling Company, and constructed the old or first experimental plant for radium processing in the east of the NRI buildings area in 1914. The success of the first plant resulted in the construction in 1915 of a larger, second plant to the south of the NRI buildings area. Minerals Recovery Company purchased the NRI plant late in

1918 but went out of business by 1920. The quantity of radium produced by this company is unknown. Production, if any, occurred in 1919 when the annual report for that year stated that the company has "a quantity of radium in process".

The National Radium Institute ("NRI") operated its ore extraction facility at West Virginia and South Elati Streets, which corresponds to the present-day location of the ROBCO site. Radium, vanadium, and uranium were extracted from carbonate ore at the facility. By June 1914, the NRI plant had begun full-scale production; in 1916, radium operations ceased. However, some fractioning operations at the NRI plant may have continued until 1918. The NRI operations ceased shortly thereafter.

Prest-O-Lite Company used an area in the southern part of the Site in the mid- and late-1920's to manufacture and service storage batteries. The company also made carbide and acetylene by a process that involved calcium carbide and hydrochloric acid. During approximately the same time period, the old NRI facility was occupied by the Mineral Products Company which was in the business of treating and sacking metallic ore insulation. From 1927 to about 1930, the NRI facility was used by U.S. Gasoline Corporation as an oil reclamation plant. Security Petroleum used the site (specific use is not known) from 1932 to 1936. Dated materials found during the 1988 EPA OU-9 Remedial Action activities indicate that a part of the site was used as a landfill in the early 1930's (primary the south part of the main Site west trench).

The NRI buildings were used as a warehouse in the early 1940's. By 1942, the Colfax Pressed Brick Company had begun operations on the Site. This company was the predecessor of the Robinson Brick and Tile Company, which is now the Robinson Brick Company ("ROBCO"), the current owner of the Site. In 1947, Western Lumber Company and Robinson Brick Company jointly occupied the premises at 500 South Santa Fe. ROBCO acquired sole occupancy of the site in 1948, and Western Lumber Company moved to 400 S. Santa Fe, which was later acquired by ROBCO in 1956. The second NRI building had been demolished by 1956 and a grinding plant had been constructed by ROBCO in the same location. The grinding plant and two small remaining NRI

buildings were demolished as part of EPA Remedial Action activities in 1988. ROBCO, a manufacturer of bricks and tiles, has continued to occupy the Site through the 1980's. Production ceased in 1984 at the S. Santa Fe location, when Robinson Brick Company moved to a more modern facility.

In 1979, the EPA discovered the presence of long-forgotten radium processing sites, which were active in the late 1800's and turn of the century. A total of 31 sites became known as the Denver Radium Site, which was placed on the National Priorities List ("NPL") in September 1983. EPA released a remedial investigation for the ROBCO site in April 1986, and a Feasibility Study in September 1986. The EPA Record of Decision ("ROD") was issued on September 30, 1986. The remedy for cleanup of the site called for excavation of radium-contaminated soils to meet cleanup levels in 40 CFR 192. Remedial action began in May 1988 and was completed in March 1991.

The Robinson Brick Company property covers 17.3 acres in an area of Denver zoned for industrial use. ROBCO is bounded on the west by South Santa Fe Drive and on the east by several north-south railroad lines that run through Denver, including lines owned by the Southern Pacific Railroad. Northwest of the property is the Regional Transportation District bus barn, which is closed. To the south of the property are two industrial currently operating businesses.

3.0 PROJECT RESPONSIBILITIES

All personnel who are involved in operations that have a potential for exposure to site-specific contaminated materials are subject to this Health and Safety Plan. The project organizational structure and key project personnel are shown in Figure 3-1. All personnel are responsible for continuous adherence to the safety procedures during the performance of the work. In no case may work be performed in a manner that conflicts with the intent of or the inherent safety and environmental cautions expressed in these procedures and standards of conduct in Section 4 of this plan.

The Site Manager and site Health and Safety Officer are responsible for ensuring that all site-specific health and safety procedures are fully implemented and followed. All personnel working on or visiting the site will be trained in accordance with the specifications of 29 CFR 1910.120 (HAZWOPER), and the elements of this Health and Safety Plan. The site Health and Safety Officer verifies such training history.

3.1 Project Manager

The ROBCO Site Closure Project Manager (PM) is responsible for reviewing the implementation of the Health and Safety Plan (H&S Plan), and correcting any deficiencies. Responsibilities of the PM include:

- . issuing the H&S Plan and all approved addenda,
- . communicating site requirements to all personnel,
- . supervising field operations,
- . consulting with the Project Health and Safety Officer regarding health and safety at the site,
- . coordinating emergency response,
- . conducting tailgate briefings,
- . being the agency liaison on all matters at the ROBCO site.

3.2 *Site Manager*

Due to the size of the site and the complexity of operations at the ROBCO site, a Site Manager is needed to assist the ROBCO Project Manager toward the safe completion of project tasks. The Site Manager answers directly to the Project Manager, and may occasionally assist the Health and Safety Officer as directed in the implementation of the site H&S Plan. The Site Manager:

- . monitors all entry into the exclusion zone,
- . is responsible for the accurate accounting of all contractors and visitors on site at any given time, and
- . will have available external communications systems to contact outside agencies, (i.e. telephone, radio-telephone),
- . assist with emergency response operations, as needed.

3.3 *Site Health and Safety Officer*

The Site Health and Safety Officer communicates closely and directly with the Project Manager, and is assisted, as needed, by the Site Manager. The site Health and Safety Officer duties include, but are not limited to:

- . ensuring the implementation of the requirements in this H&S Plan,
- . advising Project Manager on all aspects of the site health and safety activities,
- . recommending stoppage of work if any operation threatens worker health and safety,
- . facilitating the site specific tailgate briefings, training, and hazard communication training,
- . providing technical guidance for development of health and safety procedures to be used at the work site,

- . determining appropriate personal protective equipment and decontamination procedures,
- . correcting work practices or conditions that may result in injury or exposure to hazardous substances,
- . performing and documenting required worker exposure monitoring and area sampling results,
- . maintaining working files for the satisfactory completion of training and medical surveillance records of personnel on-site,
- . maintaining and updating this site specific H&S Plan,
- . performing periodic health and safety inspections.

3.4 Contractor Superintendent

The Contractor Superintendent is the person responsible for oversight of site personnel. Each contractor must appoint a Contractor Superintendent, such as a foreman, who reports directly to the Site Manager and Project Manager.

Contractor Superintendent duties include, but are not limited to:

- . ensuring that the contractor's personnel are following the H&S Plan procedures, and reporting any deviations to the site Health & Safety Officer, Project Manager, or Site Manager,
- . reporting contractor injuries or illnesses to the site Health and Safety Officer, and
- . removing damaged or inoperable contractor equipment from site operations,
- . performing contractor duties in a safe manner.

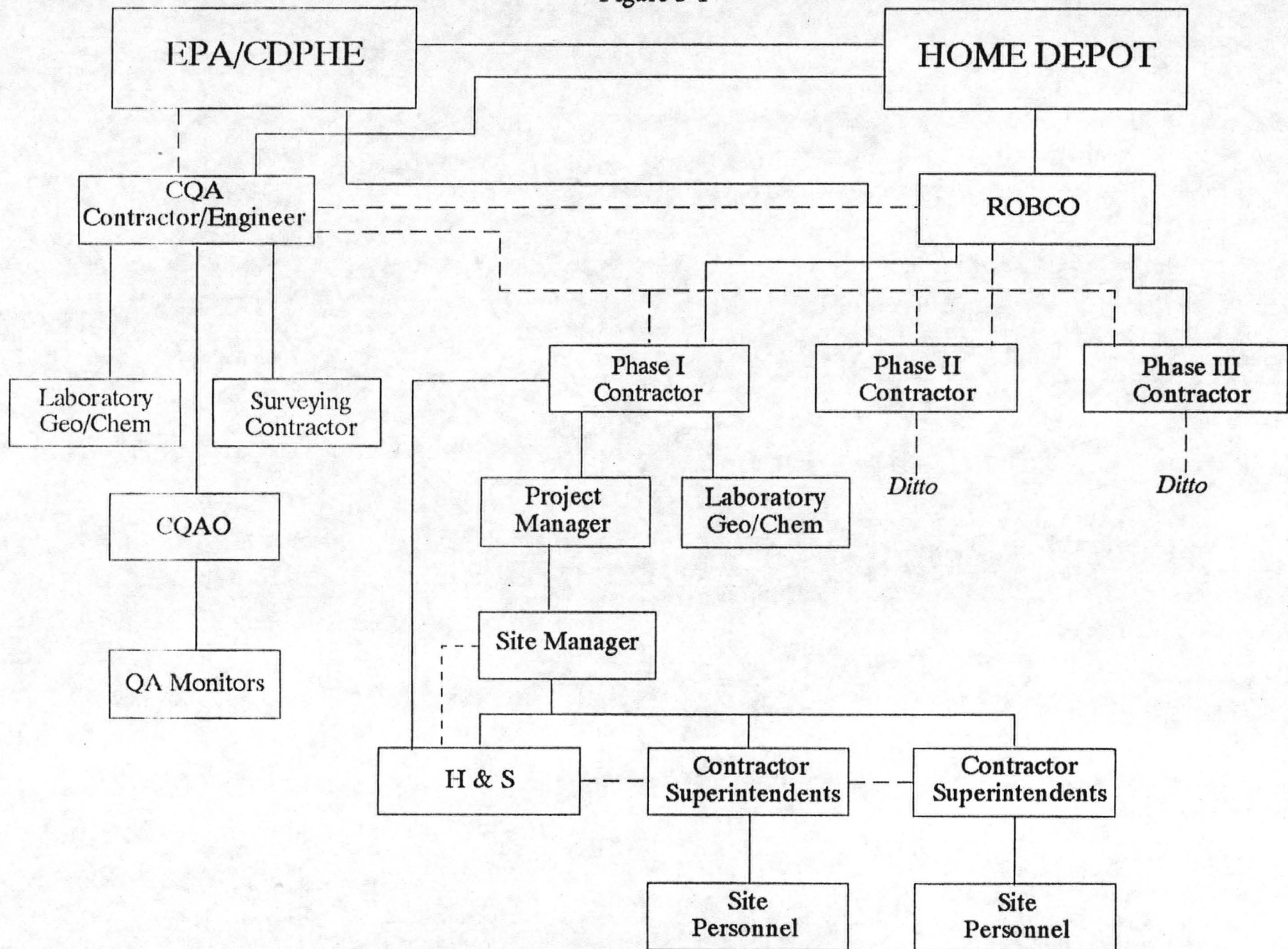
3.5 *Site Personnel*

All personnel working on the site (including site personnel, surveyors, CQA engineers) are required to understand and comply with the requirements of this H&S Plan, including the Standards of Conduct in Section 4. Additionally, all personnel working on site will be required to sign a form stating that they have been instructed on the content and intent of this H&S Plan.

The responsibilities of Site Personnel include, but are not limited to:

- . taking reasonable precautions to prevent injury to themselves and others,
- . performing only those tasks they believe they can do safely, and
- . immediately reporting accidents or unsafe conditions to the Contractor Superintendent or the site Health & Safety Officer.

Figure 3-1



4.0 STANDARDS OF CONDUCT

Compliance with the provisions of this H&S Plan will help provide a safe work environment for everyone at the ROBCO site. **Non-compliance with health and safety policies in this H&S Plan is grounds for dismissal from the site and the duration of the project.** In order to provide a safe work environment for employees, contractors and visitors, the following rules and standards of conduct must be adhered to during all activities at the ROBCO site:

1. As directed by management, safety equipment must be worn in work areas at all times. For employees and contractor personnel this, at a minimum, will be a work uniform (shirt and trousers or coveralls), steel toed boots or shoes, hard hat, and safety glasses.
2. Personal Protective Equipment (Modified Level C) will be worn in the Exclusion Zone when work activities may be taking place, or other areas at the direction of management.
3. Because of the nature of the work at the ROBCO site, it is very important for everyone to work and behave in a professional manner. Care must be taken to work in the safest way possible. Actions or behavior which may harm or endanger another person must be avoided. Pushing, shoving, horse-play, roughhousing, throwing things, practical jokes, and other boisterous or disruptive behavior will not be tolerated. Fighting is grounds for immediate disciplinary action which may include dismissal.
4. Consumption of controlled substances and alcoholic beverages on the ROBCO site is strictly forbidden.
5. Firearms, cameras and tape-recorders are prohibited unless authorized by the Project Manager.

6. AM/FM-radios, tape cassette or CD players and headphones are prohibited in all work areas.
7. Decontamination procedures will be followed as described in training and as directed by management.
8. No smoking, eating, drinking, gum or tobacco chewing, or application of cosmetics are allowed in the Exclusion and Contamination Reduction Zones.
9. All personnel will avoid contact with potentially contaminated substances. All site personnel are required to field wash as a minimum before leaving the job site. All site workers must wash hands prior to taking breaks and leaving at the end of a work shift.
10. Equipment will be operated only by fully qualified and trained contractors. Faulty or inoperable equipment will be reported to field management immediately after discovery, and taken out of service.
11. Unless authorized by management, site workers and visitors will not work or be alone in the Exclusion or Contamination Reduction Zones. The "Buddy System" will be used in these zones by all site personnel.
12. Violation of established rules, standards of conduct or endangerment of contractors or visitors must be brought to the attention of site management immediately.

5.0 SITE CONTROL AND FACILITIES

Site control is an important aspect of minimizing personnel exposure to site physical and chemical hazards. Site control includes the use of site-specific security measures, the "Buddy System", work zones, posting requirements, site communications, and visitor policies. Site facilities include provisions for sanitation and illumination.

5.1 Site Security

The ROBCO site is surrounded by a perimeter chain-link fence, topped with barbed wire in certain areas. Physical barriers are created on the site as necessary to:

1. prevent the exposure of unauthorized, unprotected people to the site hazards,
2. reduce off-site release of contaminants,
3. avoid an increase in hazards from vandals or other persons seeking unauthorized entrance to the site,
4. prevent theft of property,
5. avoid interference with safe working procedures.

All fence gates will be kept locked during non-work hours. Security will be provided at the ROBCO site by an independent contractor(s) around the clock. The Site Manager is responsible for the accurate accounting of all contractors and visitors on site at any given time. External communications systems will be available during working hours to contact outside agencies, (i.e. telephone, radio-telephone).

5.2 Work Zones

The ROBCO site will be divided into three distinct work zones:

1. Exclusion Zone,
2. Contamination Reduction Zone (CRZ), and
3. Support Zone.

All zones will be established prior to the start of investigation, construction, and remediation activities. An explanation of each zone follows.

EXCLUSION ZONE

- the work area where contaminated materials are actively being handled, disturbed, or moved, and where high concentrations of contaminants can be present.

Access into the Exclusion Zone is controlled and monitored at a single entrance and egress. All entry into the Exclusion Zone is monitored by the Site Manager. Persons not properly trained for the work and/or who have no specific business in the Exclusion Zone will not be permitted access.

The Exclusion Zone boundary can be modified as site conditions and activities change. Changes in the boundary shall be made by the Health and Safety Officer, with approval by the Project Manager. The following considerations are used to determine the boundary of the Exclusion Zone:

- location of contaminated material,
- distances necessary to prevent contamination spread during performance of tasks,
- the distances required for personnel and equipment transit,
- the area required for site operations,
- probable meteorological conditions,
- site topography and layout.

CONTAMINATION REDUCTION ZONE

- a buffer area between the contaminated area and the clean area; the purpose of the CRZ is to prevent casual access to the Exclusion Zone, and where decontamination procedures take place.

Personnel and equipment decontamination will be conducted primarily in the Contamination Reduction Zone (CRZ). The CRZ will be equipped with the equipment necessary to perform decontamination functions. The site Health and Safety Officer shall determine the decontamination configuration for this zone.

SUPPORT ZONE

- the uncontaminated area where workers should not be exposed to hazardous conditions; this zone is where administrative and other support functions are located.

The Support Zone is equipped with the following:

- First Aid Station
- Office Stations
- Personal Hygiene Washing Facility
- Restrooms
- Changing Station
- Eating, Drinking, and Break Areas
- Parking Areas.

5.3 *Buddy System*

Workers on site shall use the buddy system at all times. During investigation, sampling, monitoring, and remedial activities in potentially contaminated areas, the buddies will be dressed out in the same level of personal protection. At all times, lines of sight contact will be kept between buddies.

Field personnel must watch each other for signs of exposure to the various site hazards. Indications of adverse effects include, but are not limited to:

- changes in complexion and skin discoloration,

- changes in coordination,
- changes in demeanor,
- excessive salivation and pupillary response,
- changes in speech pattern.

Site personnel shall be instructed to inform each other of non-visual effects of exposure, such as:

- headaches
- dizziness
- nausea
- blurred vision
- cramps
- irritation of eyes, skin, or respiratory tract.

5.4 Posting

1. The entrance to the site shall be posted with conspicuous sign stating, "AUTHORIZED PERSONNEL ONLY" and "NO EATING, DRINKING, SMOKING OR CHEWING IN CONTROLLED AREAS", or similar wording.
2. Signs will be posted to meet applicable local and state requirements, and other special requirements (i.e., radioactive materials contaminated area) as necessary.
3. The Decontamination areas and access control points will be posted with signs designating them as such.

5.5 Site Communications

Successful communications between field teams and contact with personnel in the support zone is essential. The following communications system will be available during activities at the ROBCO site.

On-Site Communications

1. *Hand-held Radios - may be assigned for specific work tasks. Personnel using the radios will be instructed in the operation of the equipment before it is used.*
2. Hand Signals - may be used to supplement on-site communication, or for tasks where hand-held radios are not used. Site personnel will be instructed, before work begins, in the use of the following signals.

<u>Signal</u>	<u>Definition</u>
Hands clutching throat	Out of air/difficulty breathing
Hands on top of head	Need assistance
Thumbs Up	OK/I'm alright/I understand
Thumbs Down	No/negative
Arms waving upright	Send backup support
Grip partners wrist	Exit area immediately

Off-site Communications

To summon help from off-site, a telephone, cellular phone, or two-way radio must be on-site and in operable condition. Work must not begin until a primary means of off-site communications has been established and determined operable. A systems check must be done daily before work activities commence. The systems check establishes that the

equipment is in proper working condition, and that the equipment is not interfering with frequencies of nearby activities, or other communication sources.

A backup or secondary means of off-site communications must also be designated before work begins. Secondary communications may include telephone, cellular phone, and two-way radios that are not used for primary means. Discussion of primary and secondary communications will be part of the daily safety briefing.

5.6 *Site Visitors*

All visitors to the ROBCO site shall:

1. participate in the visitor safety briefing, which includes Hazard Communication information;
2. take caution to avoid contact with and exposure to contaminated or suspected contaminated areas and surfaces;
3. not enter the Exclusion or Contamination Reduction Zones. Visitor access beyond the Support Zone must be authorized by the Project Manager and Health and Safety Officer;
4. provide documentation of proper training and completion of medical surveillance requirements as specified in 29 CFR 1910.120 as required by the site Health and Safety Officer;
5. adhere to the policies and procedures in this H&S Plan, and any personal monitoring requirements as directed;
6. be escorted at all times;
6. adhere to personal protective equipment requirements established by the Health and Safety Officer for the day's operations;
7. provide the following personal protective equipment, as a minimum:

hard hat	safety glasses
respirator (as needed)	steel-toed footwear.

5.7 *Site Facilities*

Sanitation

The minimum sanitation requirements will provide for adequate hand washing and toilet facilities. Washing facilities will be in proximity to the work site. The number of toilet facilities will be as follows:

20 or fewer persons: one facility

20 or more persons: one toilet seat and one urinal per 40 workers

200 or more persons: one toilet seat and one urinal per 50 workers.

All washing and toilet facilities will be maintained by all site personnel in clean and operable conditions.

Illumination

Work on the ROBCO site will take place primarily during daytime hours. However, in the event that work is not done during daylight, the minimum illumination requirements in CFR 1926.56 and 29 CFR 1910.120 shall be followed. The minimum illumination for the work site will provide five foot candles of illumination and all First Aid areas will have at least 30 foot candles of illumination.

6.0 SAFETY AND HEALTH HAZARD ASSESSMENT

This portion of the H&S Plan identifies known and potential hazards at the ROBCO site, and the methods of control to be used throughout the project to minimize potential worker exposure. As a result of the industrial activities on the ROBCO property over the last century, a series of chemical, physical, and ionizing radiation hazards may exist at the site. According to EPA and State of Colorado documentation, cleanup of radioactive soils has been completed as of 1991; nevertheless, this H&S Plan addresses the potential for worker exposure to ionizing radiation.

6.1 Chemical Hazards

Based on the nature of prior operations at the site, EPA documentation, and previous investigation and characterization information, it is anticipated that the hazardous constituents present on site are primarily a result of the metal processing activities that took place before ROBCO began its operations. Soils contaminated with heavy metals, construction debris, concrete and bricks, and other debris are expected to be encountered.

Engineering and administrative controls will be given first priority for minimizing employee exposure to chemical hazards. When engineering and administrative controls are not feasible, personal protective equipment will be used to minimize employee exposure to chemical hazards.

The following is a summary of the contaminants of concern and their acute and chronic health effects that may result from exposure to the potential on-site contaminants. The information below will be disseminated during the initial site-specific health and safety training and briefings.

<u>Arsenic</u>	Short-term exposure: may result in ulceration of the nasal septum, dermatitis, gastrointestinal disorders, peripheral neuropathy, respiratory irritation.
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Long-term exposure: may cause cancer.

Asbestos

Short-term exposure: may result in dyspnea, interstitial fibrosis, restricted pulmonary function, finger clubbing.

Long-term exposure: may cause cancer.

Cadmium:

Short-term exposure: may result in pulmonary edema, dyspnea, cough, tight chest, substernal pain, headache, nausea, diarrhea, anemia, emphysema, chills, muscle aches, proteinuria, anemia.

Long-term exposure: may cause cancer.

Lead

Short-term exposure: may result in lassitude, insomnia, pallor, eye grounds, anorexia, weight loss, malnutrition, constipation, abdominal pain, hypotenuse, anemia, gingival lead line, paralysis of the writs.

Long-term exposure: may cause cancer.

Mercury

Short-term exposure: may result in cough, dyspnea, bronchial pneumonia, tremors, insomnia, irritability, indecision, headache, fatigue, weakness, stomatitis, salivation, gastrointestinal disorders, anorexia, weight loss, proteinuria, irritation of the skin and eyes.

Long-term exposure: may cause cancer and can adversely affect the fetus if the mother is exposed during pregnancy.

Respirable Particulates

Respirable particulates or dust consist of particles which are very fine in size, such that they can enter the innermost parts of the lungs. Respirable particulates are not visible to the naked eye. The hazard of breathing mineral dusts (such as sand) depends greatly on the composition of the dust, the concentration, particle size, and duration of exposure. The presence of crystalline free silica (quartz) can cause silicosis, which is a disabling irreversible pneumoconiosis.

Short-term exposure: may cause irritation of the throat and coughing.

Long-term exposure: may cause pneumoconiosis, fibrosis, or scarring of lung tissue.

Selenium

Short-term exposure: may result in irritation of the eyes, nose and throat, visual disturbance, headache, chills, fever, dyspnea, bronchitis, metallic taste, gastrointestinal disorders, peripheral neuropathy, respiratory irritation.

Long-term exposure: may cause cancer.

Silver

Short-term exposure: may result in blue-gray eyes, nasal septum irritation, throat irritation, skin irritation, skin ulceration, and gastrointestinal disorders.

Zinc

Short-term exposure: may cause sweet metal taste, dry throat, cough, chills, fever, tight chest, dyspnea, pulmonary function problems, headache, blurred vision, back pain, nausea, vomiting, fatigue.

Long-term exposure: may cause cancer.

6.2 *Physical Hazards*

Remediation activities at a former industrial site typically involve a significant number of physical hazards. At the ROBCO site, heavy equipment, buried utilities, hot work (cutting), material and waste handling, dismantling, excavations, and demolition operations expose personnel to hazards such as burns, cuts, abrasions, falling objects, heat/cold stress, and noise. Additional information on these hazards, along with others specifically related to certain job tasks is provided throughout this H&S Plan.

Engineering and administrative controls will be given first priority for minimizing employee exposure to physical hazards. Engineering controls for the ROBCO site may include, but not be limited to, guarding moving parts, dust control, and surface water

management methods. Administrative controls for physical hazards at the ROBCO site may include, but not be limited to, developing work schedules to minimize worker heat stress, strategizing methods of soil transport to minimize movement of contaminated soils on the site, and determining locations for "clean" soils to be stockpiled so that the likelihood of inadvertent contact with contaminated soils is minimized.

When engineering and administrative controls are not feasible, personal protective equipment will be used to minimize employee exposure to such hazards. For example, all persons on-site must wear a hard hat at all times, due to the possibility of exposure to flying debris and overhead hazards. Site personnel shall wear Modified Level C personal protective equipment when intrusive work occurs within established "Areas of Contamination" (AOC). When working in elevated noise areas, hearing protection will be worn. Excessive noise levels may be generated on site from heavy construction equipment, machinery, air compressors, and drilling rigs.

6.3 *Fire and Explosion Hazards*

As a fire prevention measure, no smoking is allowed on the ROBCO site. Personnel will use equipment and procedures that do not create a source of ignition, particularly in areas where there may be a possibility of flammable vapors or gases, flammable liquids, dry grass, or other flammable or combustible materials. Vehicles will not be parked or left idling in areas where a possibility of fire or explosion can occur.

Hot work, such as welding, will be performed on the ROBCO site within the guidelines in Section 16 of this plan. Hot work shall only be conducted only in accordance with the Hot Work Permit requirements, and after appropriate site inspection of fire hazards has been completed by the Project Manager or site Health and Safety Officer. At least two appropriate fire extinguishers and a fire blanket will be available during hot work operations.

If an uncontrollable fire occurs, all persons will immediately evacuate the vicinity, and the fire department will be immediately notified as outlined in the emergency procedures section of this plan.

6.4 *Radioactivity Hazards*

Radium and its associated decay products were the primary contaminants of concern during remedial action of the ROBCO-Denver Radium Site. Remediation of the ROBCO site was completed in March 1991, when the State of Colorado and the EPA agreed that the principal threat at the property was addressed, the remedy was complete, and remedial efforts were protective of human health and the environment. Although site remediation is complete, the possibility nonetheless exists for ionizing radiation to be present on site. Therefore, this Health and Safety Plan addresses the potential for worker exposure to radiation.

Radiologic contamination poses a health hazard by way of three routes of exposure:

- 1) inhalation of radon gas and its decay products;
- 2) direct exposure to gamma radiation from the decay of radium and its progeny; and
- 3) ingestion or inhalation of radium contaminated material.

The greater the exposure rate and the longer the exposure to radiation, the greater the associated health hazard. The primary health risk posed by the radium (and thorium when it degrades to radium) is from the accumulation of radon gas in overlying structures. Because no overlying structures exist on the current ROBCO site, and because most of the radioactive soil has reportedly been removed from the site as part of the ROD, there will be little risk of radon accumulation and, therefore, employee exposure. The residual radioactive material left in place at the site reportedly meets the criteria for the State of Colorado and the EPA, and supposedly do not pose a clear present or future hazard. Nonetheless, initial and ongoing monitoring will be conducted to test for the presence of radiation contamination. Worker Permissible Exposure Limits

(PEL) and Action Levels are as discussed in the Section 7, Air Monitoring and Soil Sampling Program.

6.5 Excavation Safety

All excavation activities shall be conducted in compliance with Federal OSHA regulations in 29 CFR 1926.650-.652. At a minimum, the following rules shall be strictly enforced.

- Before excavation work begins, the existence and location of underground pipes, electrical equipment, and utilities, must be determined and documented. This procedure will be done by contacting the appropriate services to mark the location of the lines.
- Excavation into which employees may be required to descend shall be sloped (1-1), benched, or shored, if they are greater than 4 feet deep.
- Excavation spoils shall be placed no closer to the edge of the excavation than two feet away.
- No employee will work adjacent to any excavation until a reasonable examination of same has been made to determine that no conditions exist exposing them to injury.
- Trees, boulders, and other surface encumbrances located so as to create a hazard to employees involved in excavation or in the vicinity thereof, any time during operations, will be removed or made safe before excavating is begun.
- At any time entry into an excavation is required, a standby person shall be made available.

- Excavations will be inspected daily by a Competent Person as defined by OSHA. Inspections will also be conducted after every rainstorm or other hazard-creating occurrence. Protection will be increased if necessary.
- Appropriate access will be used to enter and exit the excavation. Under no circumstances will an employee be permitted to ride backhoe buckets or other similar equipment to enter or exit the excavation.
- Whenever the possibility for oxygen deficiency, toxic vapors, or explosive vapors to exist in the trench or excavation, air monitoring will first be performed. Employees may NOT enter any excavation that is oxygen deficient (less than 19.6% oxygen), has flammable limits in excess of 20% LEL (lower explosive limit), or has greater than 100 parts per million volatile organic compounds as measured by a PID or similar device.

6.6 *Drilling Safety*

Site core drilling will comply with the following rules:

- Before excavation work begins, the existence and location of underground pipes, electrical equipment, and utilities, must be determined and documented. This procedure will be done by contacting the appropriate services to mark the location of the lines.
- Operations must be suspended and corrective action taken if the ambient airborne concentration of flammable vapors exceeds 0% of the LEL. A combustible gas indication shall be available to make this determination.
- Operations must be suspended and corrective action taken if the ambient airborne concentration of volatile organic vapors exceeds 100 ppm. A PID, FID, or other comparable instrument shall be available to make this determination.

6.7 *Sampling Safety*

Soil and ground water samples will occasionally be taken on site in accordance with the Work Plan. Personnel performing sampling safety may encounter chemical and physical hazards. To minimize possible exposure to hazards, persons conducting sampling shall: work in the buddy system, minimize contact with contaminated media, wear the appropriate personal protective clothing, use proper decontamination procedures for self and equipment, and handle, store, and package samples as to minimize potential leakage or spillage.

6.8 *Heat and Cold Stress*

6.8.1 *Heat Stress*

Heat stress can occur any time of the year, but it is of particular concern during warmer weather. The heat stress of employees on the ROBCO site will be monitored by the Wet Bulb Globe Temperature (WBGT) Index. This method is performed using a heat stress monitoring device, such as the WBGT Heat Stress Monitor by Reuter Stokes. A daily temperature log will be kept to measure ambient temperatures at various times during each work day. The daily temperature log is available for review at all times.

Monitoring for heat stress will be done on an established, routine basis as determined and performed by the site Health and Safety Officer. WBGT values will be compared to the ACGIH Threshold Limit Values (TLV), and procedures established according to the WBGT results and the guidance criteria by the ACGIH. The Health and Safety Officer will use the following guidelines to minimize the potential effects of heat stress:

- Adequate liquids will be provided to replace lost body fluids. Employees will be encouraged to drink more than the amount required to satisfy their thirst. Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement.

- Appropriate acclimatization schedules will be used.
- A work/rest regimen will be established, which may include additional shifts or revised work schedules.
- Breaks are to be taken in a shaded rest area.
- Employees will remove impermeable protective garments during rest periods.
- All employees shall be informed of the importance of adequate rest, acclimatization, and proper diet and fluid intake to prevent heat stress conditions from occurring.
- Salt tablets will NOT be used.

Heat Stress Monitoring and Work Cycle Management

For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

Heart Rate (HR) - should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats per minute. If the HR is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be shortened by 33%. The HR measurements will be administered by the site Health and Safety Officer.

Body Temperature - should be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99°F. If it does, the next work period should be shortened by 10 minute (33%), while the length of the rest period stays the same. However, if the oral temperature exceeds 99.7°F at the beginning of the next period, the following work cycle should be further shortened by 33%. Oral temperature should be measured again at the end of the rest period to make sure that it has dropped below 99°F.

Body Water Loss (BWL) - optional; BWL occurs due to sweating, and should be measured by weighing the worker in the morning and in the evening. the clothing worn should be similar at both weighing; preferably the worker should be unclothed. The scale should be accurate to plus or minus 1/4 pound. BWL should not exceed 1.5% of the total body weight. If it does, works should be instructed to increase their daily intake of fluids by the weight loss. Ideally, body fluids should be maintained at a constant level during the work day. This requires replacement of salt lost in sweat, as well as water replacement.

Acclimatized workers should work under conditions which do not elevate their deep body temperature above 38° C (100.4° F). Since deep body temperature measurement is not convenient, environmental temperature, work load and protective clothing parameters are used to evaluate heat stress. The American Conference of Governmental Industrial Hygienists (ACGIH) suggests a guideline relating light, moderate and heavy work load activities with a work-rest routine. The permissible heat exposure values are given in degrees Centigrade Wet Bulb-Glob Temperature (WBGT) Index. This index relates natural wet bulb temperature, dry bulb temperature and globe thermometer readings.

The ACGIH recommended heat exposure values are valid for light summer clothing worn when working under hot environmental conditions. When clothing is heavier, or impedes sweat evaporation, or has higher insulation value, worker heat tolerance is reduced. For personal protective equipment usage, correct the Wet Bulb-Globe Temperature value by subtracting 5 to 10.

The WBGT Index is calculated by the equation (outdoors with solar load):

$$WBGT = 0.7NWB + 0.2 GT + 0.1 DB$$

where

NWB = Natural Wet Bulb Temperature, DB = Dry Bulb Temperature,

GT = Globe Temperature.

The following table is a guide for work-rest regimes for light, moderate and heavy work loads, as recommended by the ACGIH.

WORK LOAD (°F-WBGT)			
<u>WORK-REST REGIMEN</u>	<u>LIGHT</u>	<u>MODERATE</u>	<u>HEAVY</u>
Continuous Work	86	80	77
75% Work, 25% rest, each hour	87	82	78
50% work, 50% rest, each hour	89	85	82
25% Work, 75% rest, each hour	90	88	86

Heat Stress Symptoms and First Aid

1. HEAT RASH: may result from continuous exposure to heat or humid air. This appears as a rash on the skin.

First Aid: Decrease amount of time in protective gear, and provide powder to help absorb moisture and decrease chafing.

2. HEAT CRAMPS: may be caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms of heat cramps include:
 - pale, cool, moist skin
 - heavy sweating
 - dizziness
 - nausea
 - possibility of fainting.

First Aid: Remove the person to a cool area and loosen clothing. Give the person cool beverages that can replace the body's electrolytes, such as Gatorade or 10K.

3. **HEAT EXHAUSTION:** the symptoms of heat exhaustion include:

- muscular weakness
- dizziness
- pale, clammy skin
- profuse sweating
- weak, rapid pulse
- shallow breathing
- vomiting
- blurred vision
- staggering gait
- possibility of fainting
- possibility of death.

First Aid: Remove person to a cool, air conditioned (if possible) place; loosen clothing, place in a head-low resting position. Give the person one to two cups of water to drink; total water consumption should be approximately one to two gallons per day. Consult a physician for severe cases.

4. **HEAT STROKE:** is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained immediately. Signs and symptoms of heat stroke are:

- red, hot, usually dry skin
- lack of or reduced perspiration
- nausea

- dizziness and confusion
- strong, rapid pulse
- possibility of coma
- possibility of death.

First Aid: Cool the victim quickly; death and/or permanent brain damage can occur if the body temperature is not brought down fast. Soak and sponge the victim in/with cool water to bring body temperature down, DIAL 911 - GET MEDICAL HELP.

6.8.2 *Cold Stress*

Exposure to extreme cold for a short time causes severe injury to the surface of the body, or results in profound generalized cooling, causing death. Areas of the body which have high surface area-to-volume ratio, such as fingers, toes, and ears are the most susceptible. Workers should be reminded that protective clothing generally does not afford protection against cold stress and can, in some instances, increase susceptibility.

Two factors influence the development of a cold injury: ambient temperature and wind velocity. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Field activities shall be curtailed if wind chill temperature is below zero (0)°F. A wind chill chart is found in Figure 6-1.

Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical protective equipment is removed and the clothing underneath is soaked with perspiration.

Cold Stress Symptoms and First Aid

1. Frostbite

Frostbite of the extremities can be categorized into:

- . frost nip - sudden whitening or blanching of the skin;
- . superficial frostbite - skin is waxy or white appearance and firm to the touch, but tissue beneath is resilient;
- . deep frostbite - characterized by tissues that are cold, pale, and solid.

First Aid: Place victim in warm, weather-protected area; rewarm affected area in water that is between 102°F to 105°F. Keep victim warm and give warm drinks (non-alcoholic, non-caffeinated). Keep affected areas covered with warm clothes for at least 30 minutes; the tissue may be very painful as it thaws. Do not allow blisters to be broken; **DO NOT RUB AFFECTED AREAS**. Use sterile, soft, dry material to cover the injured areas.

2. Hypothermia

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. The body's core temperature has been lowered, and symptoms are usually exhibited in five stages:

- . Shivering
- . Apathy, listlessness, sleepiness, and (sometimes) cooling of the body to less than 95°F
- . Unconsciousness, glassy stare, slow pulse, and slow respiratory rate
- . Freezing of the extremities
- . Death.

First Aid: Move the victim to a warm, weather-protected area. Wrap the person in warm, dry blankets to bring up body temperature. Do not administer liquids (beverages) to an unconscious victim.

6.9 *Biological Hazards*

Various insects, such as mosquitos, wasps, hornets, ants, spiders and bees may be found at the site. Care should be taken not to locate equipment and clothing in areas prone to support these hazards such as ant hills and bushes. Personnel may utilize insect repellant before donning personal protective equipment and while working in areas prone to insects. Care should also be taken when lifting possible habitats of snakes and spiders such as debris and cover. Field treatment of snake bites should be limited to submerging or covering the bite area with wet ice and/or cold compress.

Workers should minimize contact with any source of biohazards, including bloodborne pathogens. Personnel who are required to perform CPR or First Aid as a function of their job duties have potential occupational exposure to bloodborne pathogens. Such site workers must provide proof of awareness training under the OSHA Bloodborne Pathogen Standard (29 CFR 1910.1030) before beginning work at the ROBCO site.

7.0 *AIR MONITORING AND SOIL SAMPLING PROGRAM*

Air monitoring is a key element needed to make prudent decisions regarding worker health and safety. The types of monitoring that will occur on the ROBCO site include initial, ongoing, personal (industrial hygiene), area and perimeter monitoring. Information gathered will be evaluated, and adjustments in hazard controls, levels of protection, and decontamination procedures will be made accordingly.

All monitoring discussed in this section will be performed by a qualified person knowledgeable in the use, limitations, and calibration of air monitoring instrumentation. All monitoring results must be recorded and will become part of the permanent project file.

7.1 *Instrumentation*

For initial, area, and perimeter air monitoring, direct reading instrumentation from the following list will be used. The Health and Safety Officer may approve the use of additional instrumentation, as necessary. **All air monitoring instrumentation must be calibrated daily by a person knowledgeable in calibration procedures and equipment use. All calibration results will be documented.** Air sampling equipment shall not be placed or stored on potentially contaminated surfaces.

	<u>Hazard</u>	<u>Instrumentation</u>
1.	Flammable, combustible, or explosive limits	CGI (combustible gas Indicator), explosimeter
2.	Oxygen content	Oxygen Meter, combination oxygen meter/CGI

- | | | |
|----|---------------------------------------|---|
| 3. | Volatile Organic Compounds
(VOC's) | PID (Photoionization Device), FID (Flame Ionization Device), Colorimetric Tubes |
| 4. | Metals and Particulates | Mini-Ram, Portable X-ray Fluorescence (XRF), integrated sampling devices* (mixed cellulose ester cassettes) |
| 5. | Ionizing Radiation | Geiger Muller counter or equivalent |

* Not direct reading instrumentation.

7.2 *Initial Site Monitoring*

Before the project begins, initial monitoring will be conducted to establish baseline levels of airborne contaminants. Initial monitoring will occur before each phase of work at the ROBCO site begins. For each phase, initial monitoring will:

1. take place before any ground breaking occurs,
2. take place before any project personnel and contractors begin work on the site, and
3. include testing for the presence of:
 - volatile organic vapors,
 - flammable/combustible atmospheres,
 - oxygen content,
 - heavy metals, and
 - ionizing radiation.

The person performing initial monitoring shall:

1. Use the Buddy System;
2. Be knowledgeable about the instrumentation;
3. Be in a minimum of Level C PPE;
4. Monitor all areas of the work site;
5. Have a telephone or two-way radio for emergency contact off-site.

7.3 Area Monitoring

Direct reading instrumentation will be used on a routine basis for area monitoring. The purpose of area monitoring is to evaluate worker exposure levels. Monitoring results will be compared with OSHA Permissible Exposure Limits (PEL) and Action Levels to determine whether engineering controls and worker protection are adequate.

PELs and Action Levels established for the contaminants at the ROBCO site are as follows:

<u>Contaminant</u>	<u>Action Level</u>	<u>OSHA</u>	
		<u>Permissible Exposure Limit</u>	
Arsenic	0.05 milligrams/m ³	0.010	milligrams/m ³
Asbestos	0.05 fibers/cc	0.1	fibers/cc
Cadmium	0.0025 milligrams/m ³	0.005	milligrams/m ³
Lead	0.03 milligrams/m ³	0.05	milligrams/m ³
Mercury	0.05 milligrams/m ³	0.1	milligrams/m ³
Respirable Particulates*	1.5 milligrams/m ³	3.0	milligrams/m ³ **
Selenium	0.1 milligrams/m ³	0.2	milligrams/m ³
Silver	0.005 milligrams/m ³	0.01	milligram/m ³
Thallium	0.05 milligrams/m ³	0.1	milligrams/m ³
Uranium	0.025 milligrams/m ³	0.05	milligrams/m ³
Vanadium	0.05 milligrams/m ³	0.1	milligrams/m ³
Zinc	2.5 milligrams/m ³	5.0	milligrams/m ³

- * Respirable particulate mass as defined by ACGIH are those materials that are hazardous when deposited in the gas-exchange region of the body.
- ** ACGIH proposed Threshold Limit Value; ACGIH has announced a notice of intended change from 10mg/m³ to 3mg/m³.

When direct reading instrumentation or industrial hygiene monitoring results indicate that Action Levels have been reached, site hazard control measures will be evaluated by the Health and Safety Manager and Project Manager to lower exposures to below the Action Level. The appropriate level of protection will be donned as determined by the site Health and Safety Manager. When the Action Level for arsenic has been reached as detected by the Mini-Ram or similar instrument, further evaluation will be immediately made using the portable XRF. If XRF analysis verifies the presence of lead, arsenic, or zinc, personnel working in the area shall immediately don Modified Level C protection, and integrated sampling (industrial hygiene monitoring) shall be performed to determine 8 hour-TWA exposures.

7.4 Ongoing Monitoring

The site Health and Safety Officer or other qualified individual will perform ongoing area monitoring using direct reading instrumentation to evaluate levels of airborne contaminants initially monitored. Readings will be taken in the general area of work, as well as in the vicinity of the worker's breathing zone.

Ongoing area monitoring will be performed every day to qualify and quantify site contaminants, to ensure that the appropriate level of protection is being worn, and to evaluate whether appropriate decontamination procedures are being used. Daily ongoing monitoring will occur before the day's activities begin, and on a regular basis thereafter as determined by the Health and Safety Officer.

Ongoing monitoring on the ROBCO site will be done for those types of environments or contaminants detected in the initial monitoring process. Those environments or contaminants not detected during initial monitoring will not be included in ongoing monitoring, unless their presence is suspected.

To supplement ongoing monitoring, personal monitoring shall be conducted as determined by the site Health and Safety Officer.

7.5 *Personal Monitoring*

Personal monitoring, or industrial hygiene monitoring, is used to evaluate worker exposures to hazardous constituents as measured in the worker's breathing zone. The breathing zone is an approximated spherical volume around the nose and mouth of the worker. This type of monitoring requires a minimum of 8 hours of worker exposure information; therefore workers should expect to wear a personal monitoring device for the full work shift. The monitoring results will be compared with PEL's and Action Levels to determine whether engineering controls and worker protection are adequate.

A Permissible Exposure Limit, or PEL, is the maximum exposure level to which an employee can be exposed over an eight hour work day. PEL's are determined using industrial hygiene, or personal monitoring, techniques. The sampler is placed on the worker's lapel in order to adequately evaluate the breathing zone. The Action Level is lower than the PEL, and it is a level at which preliminary action is taken to prevent worker exposures from approaching PELs.

Personal monitoring is done in conjunction with and complements the medical surveillance program. Personal monitoring is accomplished by qualified personnel only, the qualifications of which are reviewed by the site Health and Safety Officer. The Health and Safety Officer may, at times, conduct industrial hygiene monitoring, as qualified.

Sampling methods, laboratory analysis, and sampling instrumentation will be selected by the qualified individual performing the monitoring, based on the specific constituent(s) being monitored. Sampling instrumentation may be required to meet certain calibrations and/or design specifications as stated in an analytical method. Because personal monitoring uses integrated or long-term sampling procedures, samples are typically sent to a laboratory, and results are not immediately available, due to laboratory analysis time. Personal monitoring results are made available to the individual employee upon request.

The methods for personal monitoring shall follow the guidelines below.

Monitoring for Respirable Dust

Direct reading instrumentation for monitoring of particulates displays total ambient dust concentrations. When the Health and Safety Officer needs supplemental information regarding specific contaminants in the dust and/or the size of the dust particles, personal samples will be taken. Personal monitoring for respirable dusts shall be conducted using battery-operated portable sampling pumps and gravimetric sampling cassettes placed in the workers breathing zone. The sampling head worn on the worker's lapel contains a filter-cassette in which the respirable dust is collected. Analysis of the dust collected on the filter gives the free silica content, which then allows determination of the applicable Threshold Limit Value (TLV). Samples will be sent to a qualified laboratory and analyzed according to the test method used.

Monitoring for Airborne Metals

Monitoring for metals using direct reading instrumentation may be supplemented by taking personal samples. Personal monitoring for airborne metals will be used by the Health and Safety Officer as needed to assist in determining specific (not ambient) metals concentrations. Such sampling shall be conducted using portable sampling pumps and

metals sampling cassettes placed in the worker's breathing zone. Samples will be sent to a qualified laboratory and analyzed according to the test method used.

Monitoring for Volatile Organic Compounds (VOC)

VOC's are not likely to be present on the ROBCO site. In the event VOC's are detected through initial and ongoing monitoring, personal monitoring methods shall be chosen and conducted by the Health and Safety Officer or other qualified individual.

Monitoring for Radioactive Contamination

Monitoring for radioactive surface contamination shall be conducted using portable alpha/beta-gamma sensitive survey meters to detect total contamination. Personal monitoring for radioactive airborne particulate shall be conducted using portable sampling pumps or low volume area pumps with glass fiber filter cassettes in the worker breathing zone. The filters will be counted in an alpha counting system. Dosimetry badges may be used, as determined by the Health and Safety Officer, if elevated levels of ionizing radiation are consistently found.

7.6 *Perimeter Monitoring*

Daily monitoring will be done around the perimeter of the site to determine whether airborne contaminants have the potential to migrate off-site. Either real-time or integrated sampling procedures may be used; the site Health and Safety Officer will make the determination of the type of sampling to be done. If on-site contaminants are detected beyond the boundaries of the ROBCO site, work operations will be temporarily stopped, and hazard controls evaluated. Work will not resume until the hazardous contaminant(s) is/are no longer detected.

7.7 *Soil Sampling*

Based on the Subsurface Investigation performed by ERM-Rocky Mountain at the ROBCO Brick Company in December 1994, three contaminants of concern were identified: arsenic, cadmium, and zinc. Soil samples will be taken during site closure operations to determine the presence of contamination at the site. Sampling shall occur throughout site closure operations on a frequency as stated in the Work Plan. Samples will be evaluated for metals using a portable XRF. To verify the accuracy of field sampling results, samples will randomly be selected for further analysis by an Inductively Coupled Plasma (ICP) argon analyzer through an approved lab, and in accordance with the Work Plan and SW-846 requirements.

8.0 HAZARD COMMUNICATION PROGRAM

The Hazard Communication Standard applies to any chemical which is known to be present in the work place in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency. ROBCO site personnel will be provided with information about the hazardous chemicals to which they are exposed. Communication of these hazards is done by means of Material Safety Data Sheets (MSDS), labels and other forms of warning, training and dissemination of information. Additional information regarding chemical hazards on the site is documented in Section 6 of this H&S Plan.

8.1 Hazard Determination

The Health and Safety Officer and the Site Manager will inspect the work areas to ensure that substances covered under the standard are addressed in the daily work operations. For materials or products brought on site for use during field work, the Health and Safety Officer will ensure that containers are labeled, tagged or marked with the identity of the hazardous chemicals and the appropriate hazard warning.

8.2 Material Safety Data Sheets

Material Safety Data Sheets (MSDS) for chemicals used on site will be obtained from the manufacturer or distributor and kept on file in three ring binder notebooks, in a conspicuous place in the work area where the hazardous chemicals are used. MSDS's will be acquired when additional materials or products are discovered on site.

MSDS's will also be made available to all personnel on site for the known and potential site contaminants that are part of the remediation efforts, such as lead, cadmium, and arsenic. Additional information regarding these contaminants is found in Section 6 of this H&S Plan.

8.3 *Information and Training, Non-Routine Tasks*

The hazards of chemicals shall be communicated to site personnel through safety briefings, and supplemented with written materials (i.e., MSDS's, warning labels). Should a non-routine task be performed, personnel will be informed of all associated hazards during safety briefings prior to the beginning of a task. The safety briefing will cover the hazards of the non-routine task, all necessary safe work practices, and the methods used for personal protection to complete the task.

Although workers will be informed of hazards on the site through the means stated above, contractors are responsible for providing formal Hazard Communication training to their employees prior to the start of work.

8.4 *Site Visitors*

Visitors to the site will be informed about the hazardous chemicals to which they are exposed. The information given to visitors is designed to provide sufficient understanding of the hazards and control measures at the site to prevent the visitor from knowingly violating any controls.

The informational session given to visitors will be part of the visitor briefing, and includes: names and hazards of chemical products and site contaminants to which they may be exposed, ways to protect oneself from exposure to chemical hazards, location of MSDS's, and site emergency procedures. Completion of such an informational session does not allow the visitor into the controlled areas of the site.

Visitors will provide signature verification that they have read, understand, and will comply with all the requirements stated in this H&S Plan. The visitor signature will serve as documentation that the visitor has received the necessary site information in accordance with the Hazard Communication Standard.

9.0 *PERSONAL PROTECTIVE EQUIPMENT*

Personal protective equipment (PPE), helps prevent hazardous contaminants and hazardous conditions from entering or affecting a worker's body. There are four ways that toxic substances can enter the body:

- inhalation,
- ingestion,
- skin contact or absorption,
- injection.

A substance can enter the body by more than one route. Site personnel will conduct work tasks in a manner that minimizes the potential for the entry of any toxic substance into the body. There are three types of protection that are available: body defenses, personal hygiene, and personal protective equipment.

Whenever feasible and practicable, administrative and engineering controls will be used to minimize potential worker exposure to hazards during remediation activities. When engineering and administrative controls cannot be used to reduce site hazards, personal protective equipment (PPE) will be used to minimize employee exposure to hazards. Site personnel must wear PPE when activities involve known or suspected atmospheric contamination, when hazardous vapor, gases, or particulates may be generated by site activities, when direct skin contact with hazardous substances may occur, and when noise levels exceed 85 dB(A).

Workers should be reminded that PPE does not remove the hazard(s). Rather, the purpose of personal protective clothing and equipment is to shield or isolate individuals from the chemical and physical hazards that exist when working on site. The wearing of PPE can, at times, increase worker susceptibility to hazard exposure.

9.1 *Minimum Standards for Personal Protective Equipment*

Careful selection and use of adequate personal protective equipment should protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing. Personal Protective Equipment to be used during ROBCO operations will meet the following minimum standards:

1. Provide adequate protection against the hazard to which the worker will be exposed.
2. Maximum comfort coupled with minimum interference and weight.
3. Minimum restrictions of essential body movement and vision.
4. Durability and ease of on-site maintenance.
5. Construction in accordance with accepted standards for performance; i.e., American National Standards Institute (ANSI), National Institute Occupational Safety and Health (NIOSH).
6. No metal hard hats will be worn on the site.

9.2 *Levels of Protection*

The specific levels of protection and necessary components for hazardous waste site work have been divided into the four categories below according to the degrees of protection afforded. Modifications of these levels are permitted, and routinely employed during site work activities to maximize efficiency.

Level A: worn when the highest level of respiratory, skin, and eye protection is needed.

ROBCO Site: Level A conditions are not expected during remedial work; site personnel will NOT perform Level A work.

Level B: worn when the highest level of respiratory protection is needed, but a lesser level of skin protection is needed.

ROBCO Site: Level B conditions are not expected during remedial work; site personnel may conduct Level B work only as authorized by the Health and Safety Officer.

Level C: worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.

ROBCO Site: Modified Level C is the **minimum** level of protection worn in the Exclusion Zone.

Level D: worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical (respiratory and skin contact) hazards.

ROBCO Site: Level D personal protective equipment will be worn, as a minimum, in all work areas outside the Exclusion Zone.

9.3 *Selection of Personal Protective Equipment*

Personal protective equipment will be selected based on the best available information pertaining to contaminants and atmospheric conditions present at the site. Three personal protective levels will be utilized during the remediation activities: Level C, Modified Level C, and Level D. All on-site personnel will be required to comply with the personal protective levels as described in this plan, and as designated by the site Health and Safety Officer.

The level of protection selected by the Health and Safety Officer is based on the following:

- type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity.
- potential for exposure to substances in air, liquid splashes, or other direct contact with material due to work being conducted.
- knowledge of chemicals on-site along with properties such as toxicity, route of exposure, and contaminant concentration.

Certain unanticipated operations or hazards not previously identified may require changes in personal protective equipment requirements. Under these circumstances, additional protective measures may be implemented by the Health and Safety Officer that include personal protective equipment other than that described in this section.

9.4 *Levels of Protection for Specific Site Tasks*

The following levels of protection will be utilized during site closure operations. Modifications to PPE requirements will be made at the discretion of the site Health and Safety Officer in accordance with this plan and site conditions.

Level C

At a minimum, **Level C** personal protective equipment will be worn whenever the potential exists for chemical contact, splash, or exposure to workers, or as directed by the Site Health and Safety Officer. The Level C ensemble will consist of:

- half- or full-face, air-purifying respirator (MSHA/NIOSH approved) with the appropriate filter cartridge, i.e. High Efficiency Particulate Air (HEPA) filter cartridges,
- chemical-resistant clothing (disposable chemical-resistant coveralls),

- . gloves, outer, chemical-resistant,
- . gloves, inner, chemical-resistant,
- . boots, steel toe and shank, chemical-resistant,
- . hard hat,
- . safety glasses or goggles,
- . boots, outer, chemical-resistant,*
- . hearing protectors.*

* based on the discretion of the field task managers regarding the work tasks to be performed.

Level C will be worn during tasks such as but not limited to:

- soils sampling
- ground water sampling from monitoring wells
- any site activity where chemical contaminated soils or liquids may become airborne
- *airborne contaminant concentrations are greater than 25% of the PEL for the specific contaminant.*

Modified Level C

Modified Level C is required when site conditions warrant a lesser level of protection than Level C, yet greater protection than Level D. Modified Level C will be worn where splash hazards are not likely to be present, and will be worn in the Exclusion Zone at all times. The Modified Level C ensemble will consist of:

- . half- or full-face, air-purifying respirator (MSHA/NIOSH approved) with the appropriate filter cartridge, i.e. High Efficiency Particulate Air (HEPA) filter cartridges,
- . disposable coveralls,
- . disposable latex gloves or equivalent,

- . hard hat,
- . safety glasses or goggles,
- . steel toe and shank workboots,
- . disposable boot covers or equivalent,*
- . hearing protectors.*

* based on the discretion of the field task managers regarding the work tasks to be performed.

Modified Level C will be worn during for:

- excavation of AOC's
- excavation during site preparation
- moving or placing soil cover and topsoil, grading areas to be covered
- backfilling AOC's
- demolition and debris removal
- the contaminant concentrations are less than 25% of the PEL for each contaminant.

Level D

At a minimum, Level D personal protective equipment will be worn in all work areas at the ROBCO site. Level D is used when minimal skin and eye protection are needed, but no respiratory protection is needed. The Level D ensemble consists of:

- . coveralls,
- . disposable gloves,
- . steel toe and shank workboots,
- . hard hat,
- . safety glasses or goggles,
- . disposable outer boots,*
- . hearing protectors.*

* based on the discretion of the field task managers regarding the work tasks to be performed.

Level D will be worn when:

- drilling wells in uncontaminated areas
- performing site activities after cover systems have been constructed over AOC's
- performing other work in uncontaminated areas.

9.5 *Hot Work*

Hot Work (cutting) operations present a serious hazard to employees' eyes. Hot Work procedures are covered in detail in the Hot Work section of this document. Protection, as outlined below, will be followed:

- Goggles or other suitable eye protection will be used during all oxygen cutting operations.
- All glass for lenses shall be tempered, substantially free from air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows shall be smooth and parallel.
- Lenses shall bear some permanent distinctive marking by which the source and shade may be readily identified.
- Goggles shall be well maintained. They should not be transferred from one employee to another without being disinfected.

9.6 *Maintenance, Inspection, Storage, and Disposal*

Maintenance

Procedures will be adopted to ensure that the appropriate level of maintenance is performed only by individuals having specialized training and equipment. Simple user or wearer maintenance, requiring a few common tools or no tools at all may be performed on site. For example, all personnel will clean their air-purifying respirators on a daily basis. Specialized, non-routine maintenance will only be performed by the factory or an authorized repair person. Periodic visual inspections of all personal protective equipment will be conducted to identify any potential problems. Any damaged or broken equipment will be immediately taken out of service and either repaired or discarded.

Inspection

PPE must be inspected prior to, during, and after use. Before-use inspections are performed prior to dressout, and include:

- * visual inspection for imperfect seams, non-uniform coatings, tears, malfunctioning closures,
- * holding clothing up to the light and checking for pinholes and non-uniform coatings,
- * observing clothing and respirators for cracks and other signs of deterioration,
- * ensuring that all parts, valves, headstraps, and facepiece of respirators are properly in place, are clean, and are not deformed,
- * performing a leak test on gloves for the possible presence of pinholes or tears.

After-use inspection shall be performed in conjunction with doffing procedures, and shall include:

- * looking for areas where PPE was not properly decontaminated,
- * looking for discoloration, swelling, stiffness in equipment,

- * checking that all parts, valves, headstraps and facepieces of respirators are properly in place, are clean, and are not deformed,
- * determining proper disposal method for PPE.

Storage

PPE must be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, temperature extremes, and impact. PPE will be stored in original sealed containers until required for use. Different types and materials of clothing and gloves should be stored separately to prevent issuing the wrong material. Potentially contaminated clothing will be stored in an area separate from street clothing.

Disposal

All disposable decontaminated PPE shall be placed in designated containers, inventoried, labeled, and properly managed. Containerized PPE will be characterized and managed at a RCRA Subtitle C facility.

If PPE shows radioactive contamination above acceptable limits, it will be disposed of as commingled waste in an appropriate manner to be determined at a later date. If the field analysis shows no evidence of contamination, and the PPE is not radioactively contaminated above limits, the PPE can be disposed as solid waste.

9.7 *Respirator Fit Testing*

Only employees who have received required training and medical verification shall be allowed to work in areas where PPE is required. All personnel must receive a fit test prior to wearing an air-purifying respirator on site. Fit testing will be conducted by a qualified individual and will follow recognized fit test protocols. Results of the

successful fit test, including the respirator model and size will be documented and kept with the individual's training file.

9.8 *Hearing Protection*

Hearing protection must be worn by all employees working in noise levels of 85 dB(A) or greater. A full discussion of hearing protection is found in Section 13 of this plan.

10.0 DECONTAMINATION PROCEDURES

All personnel working in contaminated areas shall try to minimize contact and exposure to site contaminants. Prevention of contamination is the precursor to decontamination operations.

10.1 Designated Decontamination Areas

All personnel and equipment leaving the Exclusion Zone must be decontaminated. Personnel will progress from the Exclusion Zone through the Contamination Reduction Zone (CRZ). Workers will sequentially doff their protective equipment, starting at the first station with the most heavily contaminated item and progressing to the last station with the least contaminated article. The spread of contaminants during the decontamination process will be further minimized by separating each decontamination station by a minimum of 3 feet. Ideally, contamination should decrease as a person moves from one station to another in the sequence.

The area within the CRZ immediately adjacent to the Exclusion Zone will be designated the Contamination Reduction Corridor (CRC). The boundary between the two areas is the hot-line. The CRC controls access into and out of the Exclusion Zone and confines decontamination activities to a limited area. The CRC boundaries will be conspicuously marked, with entry and exit restricted. Personnel exiting the Exclusion Zone must go through the CRC. Anyone assisting the decontamination process must wear the same level of protection or one level below that of the workers being decontaminated.

A separate corridor shall be present for heavy equipment decontamination. A decon pad shall be constructed for heavy equipment decon. These areas will be clearly marked and personnel restricted to those wearing the appropriate level of protection. See Section 10.3 for details.

Clean personal protective clothing, respirators, monitoring equipment, and sampling supplies will be maintained outside of the CRC. Personnel don their PPE in the Support Zone and enter the Exclusion Zone through a marked, separate access control point at the hot-line.

10.2 Personnel Decontamination Procedures

Personnel decontamination will be carried out in the CRC in accordance with the following procedures. For equipment decon, see Section 10.3.

1. At the start of each work day and following the lunch break, dress-out will include a clean uniform and equipment as described in the Personal Protective Equipment section of this Plan. Personnel will then enter the Exclusion Zone through the CRC.
2. When ready to exit the Exclusion Zone, personnel should make every effort to remove gross contamination from their boots and gloves prior to leaving the Exclusion Zone, and beginning decontamination procedures in the CRC.
3. Decontamination prior to lunch and the end of the work day will be accomplished according to the following procedures:
 - a. Remove any disposable garments used in hazardous waste activities by undressing from the top down and by pulling garments from the inside out. Place these articles in designated collection containers for contaminated personal protective equipment.
 - b. Wash stations will be available to decontaminate any personnel and non-disposable equipment which may have come into direct contact with hazardous waste. This decontamination will be accomplished by brushing off

dirt and dust, and rinsing with water and a suitable cleaning agent. A mild soap and warm water solution compatible with personal protective clothing shall be used.

- c. Respiratory protection equipment must be free of gross contamination, cleaned, sanitized and placed in a plastic bag when not in use.
 - d. Proceed to hand washing area and thoroughly wash hands and face to remove any contaminants.
 - e. Upon completion of (a) through (d) above, personnel may proceed to support areas or leave the site.
- 4. Limited decontamination, consisting of removal of gross contamination in the Exclusion Zone will be required prior to entry into the work day break room or toilet facility.
 - 5. Decontamination and replacement of uniform is required at any time waste comes into contact directly with the employee's skin or indirectly through clothing. All chemical and waste exposures must be reported to Site Manager or Health and Safety Officer immediately.
 - 6. If an employee develops a rip or tear on his/her protective outer wear, the employee will return to the decontamination area, wash any contaminated skin and put on new protective clothing.
 - 7. Under no circumstances will contaminated clothing or personal protective equipment leave the facility. This includes entering personal vehicles and company vehicles for off-site travel.

10.3 Heavy Equipment and Tool Decontamination

Heavy Equipment

Gross contamination of heavy equipment will be removed prior to the equipment leaving the Exclusion Zone. A separate Contamination Reduction Corridor equipped with a decon pad shall be present for heavy equipment decontamination. These areas will be clearly marked and personnel restricted to those wearing the appropriate level of protection. In addition to hand-washing of equipment, pressure washing may be used to remove contamination. Areas washed will include the undercarriage of vehicles.

Tools

Gross contamination of all tools used within the Exclusion Zone will be removed prior to leaving the Exclusion Zone. Site personnel shall inspect the tools to make sure that gross contamination has been removed. Tools shall then be further decontaminated by either being washed or wiped while progressing through the Contamination Reduction Corridor. Either the heavy equipment or personnel corridor may be used to decon tools. A mild soap and warm water solution shall be used for tool decontamination.

10.4 Decontamination Procedures for Emergency Response Actions

In emergency situations, decontamination will be followed to the degree practicable as described in this section. In the event of an emergency requiring non-routine decontamination, the Site Manager will direct the activities. The exact procedures to use will be determined after evaluating the factors specific to the incident. All personnel are responsible for: 1) conducting themselves in a mature, calm manner during an emergency; and 2) following directive from the PM or Health and Safety Officer.

Treatment of life-threatening injuries is the number one priority. In these situations, decontamination procedures are a secondary concern. Where radiation contamination is a factor, a life-threatening injury outweighs radiological control

considerations. Emergency decontamination procedures are also discussed in Section 19 (the last section) of this plan.

10.5 Disposal

All disposable decontaminated PPE shall be placed in designated containers, inventoried, labeled, and properly stored and managed. Containerized PPE will be characterized and managed at a RCRA Subtitle C facility, if it cannot be disposed of on site.

The water used for decontamination shall be placed in designated containers, inventoried, labeled, and properly stored and managed. Decon water will be sampled, analyzed, and disposed of in accordance with applicable federal, state, and local regulations.

If PPE shows radioactive contamination above acceptable limits, it will be disposed of as commingled waste in an appropriate manner to be determined at a later date. If the field analysis shows no evidence of contamination, and the PPE is not radioactively contaminated above limits, the PPE can be disposed as solid waste.

Nondisposable PPE will be decontaminated according to procedures in this section. Nondisposable PPE can be reused only if it meets inspection criteria listed in Section 9 of this plan.

11.0 MEDICAL SURVEILLANCE PROGRAM

Medical Surveillance Programs are designed to survey pre-employment or baseline conditions prior to potential exposures and monitoring physical conditions on a regular basis. The medical surveillance program is an integral part of this Health and Safety Plan. All personnel on site who have potential for exposure to hazardous materials will have successfully completed a pre-placement or periodic/update physical examination in accordance with 29 CFR 1910.120 requirements. The site Health and Safety Officer is responsible for verification of such records.

11.1 Baseline or Pre-placement Examination

Prior to being assigned to a hazardous or a potentially hazardous activity involving exposure to toxic materials, site personnel must receive a pre-placement or baseline medical examination. Medical examinations performed under this program will be performed by a qualified physician familiar with the effects of the chemicals on site. The content of the pre-placement examination is to be determined by the employer's medical consultant. However, the exam must contain as a minimum the requirements of 29 CFR 1910.120, including the following:

- complete medical and work history
- physical examination
- pulmonary function tests (FEV, FVC)
- Chest X-ray
- EKG
- eye examination and visual acuity
- audiometric testing at 500, 1000, 2000, 3000, 4000, 6000 Hertz
- urinalysis
- blood chemistry, including hematology, serum analyses, and heavy metals toxicology and liver
- blood lead, zinc protoporphyrin

The pre-placement exam should qualify site personnel as fit-for-duty and able to wear respiratory protection.

11.2 Periodic Monitoring

In addition to baseline examination, all employees shall complete a periodic annual examination unless the advising physician believes a shorter or longer interval is appropriate. Periodic monitoring should be part of each employer's Medical Surveillance Program. Verification of such monitoring shall be accomplished by the site Health and Safety Officer.

11.3 Injury, Illness, and Exposure Re-Examinations

If an injury, illness, or exposure occurs from site work, the Site Manager or site Health and Safety Officer will be immediately notified, and steps promptly taken to identify the chemical or physical agent. The site Health and Safety Officer is ultimately responsible for the completion of all records regarding the incident or exposure, including accident investigation.

As needed, the affected worker will be given a physical examination relevant to the exposure. The "re-examination" should be conducted within 24 to 48 hours of the reported condition. Any employee who develops a lost-time illness or sustains a lost-time injury will be re-examined. A qualified physician will certify in writing that the employee is fit to return to work, and will state any activity restrictions.

11.4 Recordkeeping

Medical surveillance records and exposure monitoring records will be maintained by the site Health and Safety Officer. Records will be kept on site for the duration of the project, and for a minimum of thirty (30) years in accordance with 29 CFR 1910.20.

The physician's written opinion stating that the worker is fit to perform work and to wear respiratory protection will be part of each employee's medical records file.

Contractors are responsible for maintaining summary of worker injuries and illnesses (OSHA Log 200), and individual injury and illness reports (OSHA Form 101 or Workmens Compensation Form). A copy of each injury or illness report must be supplied to the Home Depot Manager.

11.5 Accident Investigation

All fatalities and multiple hospitalization incidents (3 or more persons sent to hospital) will be investigated by the Health and Safety Manager. All contractors and site personnel will cooperate and assist the investigation as applicable. Investigations shall be performed as soon after the accident as possible to review of accident site, interview persons involved, and to document all conditions. Accident investigation records will be kept as a permanent part of the job file, and copies will be given to the Home Depot Manager.

12.0 FIRST AID AND MEDICAL SUPPORT PLAN

12.1 First Aid

A First Aid station will be available on the ROBCO site during operating hours. The First Aid area will be equipped and maintained in a professional manner under the supervision of the site Health and Safety Officer, and will be equipped with the supplies needed to treat minor injuries. The location of the First Aid Station should provide immediate access to First Aid supplies for both the Support and Contamination Reduction Zones.

If injuries occur, workers are required to immediately notify the Site Manager or site Health and Safety Officer. The First Aid equipment listed below will be available on site at all times during working hours. The site Health and Safety Officer is responsible for maintaining this equipment.

- American Red Cross First Aid Handbook
- First Aid Kit
- Fire Extinguishers
- Fire Blanket
- Portable Eye Wash Unit.

12.2 Emergency Services

Arrangements will be secured with the following emergency services prior to operations, or these services will be provided on-site.

- a. Emergency Hospital Services
911 or 893-7244 (Denver General Hospital)

- b. Emergency Medical Air Lift Services
AMI Presbyterian Hospital, 700 Potomac, Aurora, 360-3133 (Emergency Room) or 360-3400 (Air Lift)

- c. Ambulance Services - Denver General Hospital
Call 911

See Section 19 of this plan for detailed site emergency procedures.

13.0 HEARING CONSERVATION

Certain activities on the ROBCO site, such as the use of heavy equipment and machinery, can create noise levels in excess of the OSHA PEL. Whenever possible and practicable, engineering and administrative controls will be used to control or abate noise hazards. When engineering and administrative controls are not applicable, hearing protection devices will be relied upon to protect site personnel. Hearing protection will be provided to all site personnel when they may be exposed to a Time Weighted Average (TWA) of 85 decibels (dBA) or greater.

Noise levels will be monitored as determined by the site Health and Safety Officer. Based on noise level monitoring results, hearing protection with the appropriate noise reduction ratings (NRR) will be selected by the Health and Safety Officer. All noise monitoring results will be documented and kept as part of the permanent project file. Hearing protection equipment, such as ear plugs and muffs, are considered personal protective equipment (PPE) and will be maintained as stated in Section 9 of this plan.

All hearing conservation measures taken by the Health and Safety Officer for ROBCO site activities will be done in accordance with the OSHA regulation for occupational noise exposure (29 CFR 1910.95). Noise sources will be identified using a sound level meter. Actual worker noise exposure will be accomplished using noise dosimeters. Hearing protection will be worn by all persons working in noise levels of 85 dB(A) or greater.

14.0 PERSONNEL TRAINING PROGRAM

Prior to arrival on site, each employer will be responsible for certifying that his/her employees meet the requirements of pre-project training. Pre-project training is necessary to safely and successfully complete all job tasks assigned, and to be familiar with hazardous waste site operations. Pre-project training, coupled with daily safety briefings, provides site workers with the information needed to safely and successfully carry out daily tasks and overall project operations.

14.1 Pre-Project Training

All contractors who work on site shall have successfully completed the following training requirements before engaging in the remediation activities at the ROBCO site. All training records of all site personnel will be verified by the site Health and Safety Officer prior to their commencing work at the site.

1. 40 Hour Hazardous Waste Operations and Emergency Response

All personnel on site will provide a current certificate of training in accordance with 29 CFR 1910.120, OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) regulation.

General Site Workers

For general site employees who work on site, a minimum of 40 hours of initial off-site instruction plus three days of actual field experience under an experienced supervisor are required. Proof of 8 hours of annual refresher training is required beyond the worker's initial training date.

Workers On Site Occasionally

A minimum of 24 hours of off-site initial training and one day of actual field instruction under an experienced supervisor is required, plus 8 hours of annual refresher training. Proof of 8 hours of annual refresher training is required beyond the worker's initial training date.

On-site Supervisors

On-site supervisors shall have completed 40 hours of initial training and an additional 8 hours of supervisory training in compliance with the regulation.

2. Hazard Communication

Employers will ensure that their employees are trained in accordance with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Employees on site should be familiar with basic chemical hazards, toxic effects, material safety data sheets, labels, routes of exposure, personal protective equipment, ways to minimize exposure to chemical hazards, and the nature of job tasks that could result in exposure to chemicals on a hazardous waste operations site.

3. Personal Protective Equipment

Respiratory Protection

Because contractors will be wearing respiratory protection during certain remedial activities, each employer must train his/her employees in the use, limitations, inspection, storage, and maintenance of air purifying respirators (APR). The employer is also responsible for conducting respirator fit tests before the employee arrives at the site. The fit test will consist of a minimum of qualitative testing, such as the use of irritant smoke in a plastic containment structure. Written verification of such training must be supplied to the site Health and Safety Officer before the employee begins work at the site.

Protective Clothing

Employers will train their employees in the use, limitations, and selection of protective clothing prior to work start-up. Included in this training will be the effects of heat and cold stress, decontamination, storage, inspection, and cleaning of equipment.

Hearing Protection

Prior to employees engaging in work activities at the ROBCO site, they will be trained by their employer in the proper use, selection, limitations, and permissible exposure limits related to hearing protection. The employer will ensure that the training includes all elements of 29 CFR 1910.95.

4. First Aid/CPR and Bloodborne Pathogens

All site workers must provide proof of current training certification in basic First Aid and CPR. When performing First Aid/CPR is a function of a worker's job duties, the worker is considered to have potential occupational exposure to bloodborne pathogens. Therefore, contractors must ensure that their employees receive at least awareness training regarding bloodborne pathogens as defined by OSHA in 29 CFR 1910.1030.

14.2 Site-Specific Training

All potential health and safety hazards at the ROBCO site, and the requirements of this Health and Safety Plan will be communicated to all persons entering the work area. Such information will include, but not be limited to: chemical hazards, physical hazards, ionizing radiation hazards, MSDS's, emergency procedures, site communications, and all other relevant site information.

The Training Program is also designed to ensure that all designated employees are capable of effectively implementing the proper emergency procedures, should the need arise. Accidents and emergency situations can be properly minimized by having a work force which is trained to perform their jobs properly. If an emergency does occur, its consequences can be minimized through rapid and effective response.

14.3 Tailgate Safety Briefings

Purpose

A tailgate safety briefing will be conducted daily at the ROBCO before activities begin. Tailgate safety briefings are another vehicle for the transmittal of information. The tailgate safety briefing provides health and safety considerations for the day's activities, and is NOT considered a formal training session. The tailgate briefing provides site-specific information that supplements formal pre-project training conducted by the employer.

Topics Discussed

The topics discussed at a tailgate briefing include:

- health and safety considerations for the day's activities
- names of personnel and alternates responsible for site health and safety
- SOP's for the day's activities
- emergency procedures, including means of communication
- safe use of engineering controls and equipment on site
- site access controls, postings
- any new revisions to the site Health and Safety Plan
- any new MSDS filed on site,
- all documented and observed unsafe acts committed on sit since the previous meeting, and a clarification of related safety requirements
- location of First Aid kits, eye wash stations, fire extinguishers, MSDS, and other applicable items.

Recordkeeping

All employees are required to attend tailgate safety briefings and sign an attendance sheet verifying that they were present and understood all the daily information and health and safety requirements. Documentation of these meetings will be part of the permanent project files.

14.4 *Recordkeeping*

The Project Health and Safety Officer will keep copies of all job-specific training records, including attendance sheets from health and safety meetings and briefings. In addition, the site Health and Safety Officer will also maintain copies of the OSHA 40-hour and 8-hour certificates for all project personnel.

15.0 HEAVY EQUIPMENT OPERATION

The following information pertains to work around heavy equipment and the safe handling of heavy materials.

- Use common sense.
- Employees should pay attention to what they are doing and what they are being told at all times.
- Maintain visual contact with another person at all times.
- Establish hand signal communication when verbal communication is difficult. Identify one person per work group to give hand signals to equipment operators.
- Maintain secure footing at all times.
- All heavy equipment must have operational backup alarms of some type.
- Only qualified and trained personnel are to operate heavy equipment.
- Use designated chains, straps, and other approved equipment to safely move heavy materials.
- Use proper manual lifting techniques. Employees are instructed to use their legs, not their back. Use the buddy system.
- Employees should never walk directly in back of, or to the side of, heavy equipment without notifying the operator of their presence and intent.
- Never use a piece of equipment unless familiar with its purpose and trained in its operation. This applies to all equipment.
- Be sure that no underground or overhead power lines, sewer lines, gas lines, or telephone lines will present a hazard in the work area.
- Get help when in doubt about a material's weight.

16.0 HOT WORK PROCEDURES

Hot work operations are not likely to take place during remedial activities at the ROBCO site. However, in the event that hot work is performed, the procedures in the following paragraphs must be adhered to. In recognition of the potential hazards associated with hot work (cutting or welding) operations, an established procedure must be designed to minimize the risk associated with such operations. OSHA, in 29 CFR 1910.252, requires that procedures and training be provided for these operations. To comply with this regulation, the potential hazards, the safety precautions, personnel responsibilities, and general cutting procedures are discussed in this section.

16.1 Hot Work Hazards

As with many flame-producing operations, there are four main hazards that might be encountered while conducting hot work procedures. These include:

- fire,
- explosion,
- burns, and
- toxic substances.

Fire

Whenever an open flame is produced, there is a chance that some adjacent material might be exposed to the flame, and a fire might be started. All of the elements required for a fire are available during hot work - heat, flame, fuel, and oxygen. Extreme caution must be taken to prevent a fire, from the initial set-up to the post-work inspection.

Explosion

Explosions can be associated with a fire, but other types of explosion can occur without fire or flame. Explosions can occur by over-pressurizing an unvented vessel. During hot work, an unvented tank might explode due to:

- the heat expanding the gases inside the tank, causing the tank to rupture,
- the flame of the torch ignites the tank's contents, or
- a combination of the heat and flame.

Burns

Burns can occur in conjunction with a fire or explosion, or through careless handling of the torch and heated surfaces. Contacting the torch's flame through carelessly leaving it lit while performing other operations or touching the surface of the metal being worked on can cause permanent damage and disfigurement, and a great deal of pain. With a little precaution and thought, most burns can be avoided.

Toxic Substances

Hot work can produce toxic substances through the combination of the acetylene, oxygen, and the surfaces being cut or welded. If the metal surfaces have been in contact with chemicals, the problem can be an even greater threat to health.

Through proper ventilation and surface cleaning, the toxic substance threat can be minimized.

16.2 Hot Work Permit

Before hot work begins, a Hot Work Permit will be completed and approved by the site Health and Safety Officer. Contractors are responsible for adhering to all permit

conditions, and stopping work if impermissible conditions exist. The Health and Safety Officer or Site Manager will be responsible for checking that work is being performed under permissible permit conditions.

16.3 Safety Precautions

Employees must always take the following safety precautions during hot work:

- wear specialized personal safety equipment,
- wear protective clothing,
- wear respiratory protection,
- practice fire prevention,
- have immediate access to fire protection equipment, and

16.4 Personal Safety Equipment

Hot work procedures require the wearing of some specialized personal safety equipment, such as:

- goggles with the correct shading factor (see Table 1),
- fire-resistant apron, and
- fire-resistant gloves

Table 1 Shading Factors for Cutting Operations

Cutting Operation	Shading Factor
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 to 6 inches	4 or 5
Heaving cutting, over 6 inches	5 or 6

16.5 Fire Prevention

Whenever possible, the area should be secured so that **NO** flammable material is present within a 35-foot radius. If the flammable material cannot be removed from the 35-foot radius, fireproof barriers and/or fire watches must be present. No ignitable or hazardous waste is allowed within 50 feet of the hot work area.

16.6 Fire Protection

An adequate number of the proper type of fire extinguishers must be present before the hot work operation takes place. With the high probability of fire and/or explosion during hot work activities, immediate access to fire extinguishers is critical for safe operations.

16.7 General Cutting Precautions

The precautions and pointers below are provided to protect equipment and/or personnel from potential fire hazards associated with welding or cutting operations:

- never use acetylene if tank pressure is at or below 7 psi,
- never lift cylinders by their valve protector caps,
- never allow cylinders to lie in horizontal positions,
- never permit grease or oil to come in contact with cylinder valves or hoses (remember, oxygen is a necessary component for any fire: keep oxygen away from combustibles),
- never expose cylinders to extreme heat, sparks, or flames,
- never transport a cylinder by dragging, rolling, or sliding it along the ground,
- IMMEDIATELY notify a Site Manager of any damaged or leaking cylinders,
- before moving a cylinder, ensure that the valves are closed,
- never tamper with or attempt to repair cylinder valves,

- keep valves closed on empty cylinders,
- never use a hammer, wrench, or other tool to open cylinder valves; always open by hand,
- keep cylinder caps on when cylinders are not in use,
- always ensure that cylinders are secure (so that they cannot tip over) by attaching the cylinder to a stable object with chains or straps,
- make sure the adjusting screw is released or turned out before the cylinder valve is opened,
- never use oil in the regulator,
- never interchange oxygen and acetylene regulators,
- oxygen hoses are green or black, acetylene hoses are red,
- never use matches or lighters to ignite the torch,
- never face the regulator when opening the cylinder valve,
- never use pressurized gases to remove soil or debris,
- never lay a torch on the ground, always place it in the storage tray,
- when leaving the area, follow all shut down procedures and start over upon returning (this includes breaks, restroom and lunch breaks, as well as any time you will be more than 25 feet away from the equipment),
- never carry a lighter into the work area,
- never place anything on top of a cylinder or use the cylinder as a support or roller even if it's empty, and
- never tamper with numbers or markings on the cylinders.

16.8 General Cutting Procedures

1. Be sure cylinders are secured to the cart.

2. Be sure that all the proper safety equipment is in place and that all personal protective equipment is being worn.
3. Prior to attaching the regulators to the cylinders, be sure that the regulator screws are turned out. NOTE: You need to see at least three threads.
4. Momentarily "crack" the cylinder valve to blow out dust or foreign particles from the valve.
5. Make sure the inlet connection filter is clean and in place.
6. Attach regulators to cylinder valves and tighten snugly. (NOTE: Overtightening will not increase the seal, but will only damage the fittings). Remember that acetylene connections are reverse threads.
7. Check the seal with a test solution. If bubbles form, the seal is not secure. If this occurs DO NOT overtighten the regulator; instead, contact the supervisor immediately.
8. Stand to one side of the regulator and VERY SLOWLY open the cylinder valve on the oxygen all the way. Open the acetylene valve no more than 1/2 turn. Take the T wrench out of the cylinder and keep it close at hand.
9. To adjust working pressure on the oxygen, depress the oxygen lever on the torch while maintaining 40 psi on the pressure gauge.
10. A working pressure of 6 pounds should be maintained on the gauge for acetylene with the acetylene valve open on the torch. The working pressure on the acetylene regulator should never exceed 7 pounds.
11. Keep cylinders as far away from the work area as possible.

12. Open the acetylene torch head and use the striker to ignite. Adjust the flame so that only smoke is visible coming off the torch head (no particles).
13. Turn on the oxygen torch head and adjust to obtain 6 short blue flames at the torch tip. The flame should be no longer than 1/4 inch in length.
14. To cut, hold the torch tip 1/8 to 1/4 inch away to heat the metal. When the metal begins to turn to liquid, depress the oxygen lever full on and slowly advance torch in the direction you want to cut. For best results, keep the torch tip vertical or slightly angled in the direction of the cut.
15. When cutting is completed, turn off the acetylene torch first, and then the oxygen. Turn off regulators and make sure valves at the torch head are closed. Be sure to clean the tips and put the cutting rig back in its proper storage area when the work is finished.

FOR CUTTING, set the acetylene pressure at 5-7 pounds per square inch (psi), and set the oxygen pressure at 40 psi.

ALWAYS SHUT OFF ACETYLENE FIRST, and ensure that the flame arrestor is properly installed.

17.0 MATERIAL HANDLING PROGRAM

Hazardous substances and contaminated soils, debris, liquids, and other residues will be handled, transported, labeled and disposed of in accordance with this program. All drums and containers used at the ROBCO site will meet the appropriate DOT, OSHA and EPA regulations for the materials and wastes they contain.

Drums and containers will be inspected to ensure their integrity in accordance with procedures described in this program. Unlabeled containers will be managed according to the procedures established in the Hazard Communication Program and they will be considered to contain hazardous substances until the contents are positively identified and labeled.

Drum and container staging areas used for identifying and classifying materials will be established. Bulking of materials for on-site management or off-site transfer will be done only in accordance with procedures identified in this plan.

Drums and containers will be managed, handled, transferred, moved or opened according to the established procedures.

17.1 Precautions for Drum Handling

Drums will be handled according to the following procedures:

1. Inspect material for slivers, jagged edges, burrs, rough or slippery surfaces.
2. Get a firm grip on the object.
3. Keep fingers away from pinch points, especially when setting down materials.
4. Wipe off drum before handling especially if it is greasy, wet or dirty.

5. Keep hands clean of waste materials.
6. If load is heavy to move, use two (2) people or drum handling equipment to handle load safely.

17.2 Manual Drum Handling

In situations where drums cannot be moved by mechanical means, drums must be moved by hand. Drums are heavy, bulky items that can cause serious injury if improperly handled. The following steps must be taken to move drums safely:

1. Safety checks
 - a. Wear gloves and other PPE.
 - b. Make sure that you have enough room to move the drum.
 - c. Make sure the rolling surface is free of hazards such as holes, debris, and other types of interference.
 - d. Check the bottom chime of the drum for dents; check the top chime to make sure it is secure and free of burrs.
 - e. Check the bung hole, if present, and make sure the plug is tight.
 - f. Examine the drum for any leaks or serious damage.
 - g. Check the drum label so that you know what you are moving.

17.3 Mechanized Drum and Materials Handling Procedures

1. Equipment Condition
 - Guards must be on all vehicles (open bar rail necessary for visual overhead work).
 - Back-up alarm (manual or electrical) must be in working order.
 - Horn must be in operable condition at all times.

- All signal lights must be in working order.
- Seat belts must be worn at all times.

2. Equipment Operating Precautions

- **LOAD PROPERLY.** See that the load is correctly stacked and balanced, and is well back on the forks, bucket, or other lifting devices.
- **KEEP BRAKES APPLIED ON DOWN GRADES.** When descending ramps and other down grades, apply brakes. Coasting may allow the truck to get out of control. Brakes must be kept in proper adjustment.
- **OBEY ALL STOP TRAFFIC RULES.** Slow down, sound warning, and be alert at passageways and corners. Obey the traffic rules to promote accident prevention.
- **ACCELERATE AND DECELERATE GRADUALLY.** Gradually accelerate power trucks using all accelerating speeds. Apply brakes slowly to eliminate any tendency of the load to shift or fall off. Lift and lower loads smoothly.
- **DRIVE CAREFULLY OVER ROUGH SPOTS.** Excessive speed over rough spots may jar part of the load loose and cause injury to operator and people nearby. Report all rough spots to a field task manager.
- **DAMAGE REPORT.** Report all damages and faulty equipment to a Site Manager immediately.

3. Equipment Operating Instructions

- No material is to be unloaded onto or from a pallet that is held by a forklift truck or similar vehicle.
- Forklift and other vehicle operators must remain at the control position at all times when forks, buckets, or other lifting devices are in a raised position.
- Forks, buckets, and other lifting devices are to be kept at the lowest possible position when vehicles are left unattended.
- Operators are to use caution when going around blind corners or in other areas where visibility is limited. Horns should be used as warning signals.

- Forks, buckets, and other lifting devices are to be kept as low as possible to the floor or roadway, with or without a load, to provide maximum stability and visibility when moving.
- No employees are to operate a forklift truck or other vehicles unless properly trained and then only when authorized to do so by a field task manager.
- Shut down equipment should any unusual noises or actions of the pumps, hydraulic system or other mechanical equipment be observed and report to a field task manager immediately.

18.0 RECORDKEEPING

Implementation of the provisions of this H&S Plan must be completely documented. The site Health and Safety Officer will maintain files for health and safety related records and documentation, activity reports, and field logbooks or notes. This comprehensive file should contain the following records:

- . A list of personnel engaged in each site activity and verification of the use of the specified protective and environmental monitoring equipment.
- . Air sampling pump calibration records, sampling data sheets, and chain-of-custody forms.
- . Equipment inventory and ordering information.
- . Equipment calibration and maintenance records.
- . Copies of safety equipment operation manuals.
- . Employee work hours totaled (time-sheets).
- . Employee injury/illness/exposure incident reports.
- . Safety violation records and remedial actions taken.
- . Copies of all job-specific training records.
- . Copies of daily field safety briefing notes and signatures.
- . Documentation of personnel access/egress from work zones.
- . Other pertinent health and safety related observations.

All health and safety related documentation shall be maintained as part of the permanent ROBCO project file.

19.0 EMERGENCY RESPONSE AND CONTINGENCY PLANS

This Health and Safety Plan has been established to complete work operations at the ROBCO site without adverse impacts on workers' health and safety. In the unexpected event that a worker is injured or overexposed, the following emergency procedures shall be put immediately into effect.

The emergency procedures in this plan are compatible with local, state, and federal disaster and emergency management plans as applicable. The applicable elements of RCRA contingency planning are incorporated into this section.

19.1 Emergency Telephone Numbers

The following information will be posted at conspicuous locations where field activities will be performed:

POLICE	892-9111	OR	911
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AMBULANCE	892-9111	OR	911
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DENVER GENERAL HOSPITAL	436-6000	OR	911
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FIRE DEPARTMENT	892-9111	OR	911
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EMERGENCY MEDICAL AIR LIFT SERVICES	360-3400 (Air Life)		
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19.2 *Pre-Emergency Planning*

The types of incidents that can occur at the ROBCO site include:

- fire
- explosion
- chemical release
- medical (injury, illness, fatality)
- severe weather events
- security.

Daily Safety Briefings

During daily safety briefings, all site personnel will be informed and reminded of provisions of the site-specific emergency response plan, communication systems, and evacuation routes. The plan will be reviewed and revised if necessary, on a regular basis by the site Health and Safety Officer. This will ensure that the plan is adequate and consistent with prevailing site conditions. Additionally, a map showing the most appropriate route to the closest medical facility will be posted at the site, and is included in Appendix A of this plan.

Site-Specific Information

Site-specific emergency response information will focus on the recognition of health and safety hazards in order for employees to protect themselves and their fellow employees.

This information includes:

- methods for minimizing the risk from safety and health hazards;
- safe use of spill and fire control equipment;
- selection and use of appropriate personal protective equipment;
- safe operating procedures for use at the scene of an emergency response incident;
- techniques for coordinating with other employees in order to minimize risks;
- familiarity with shut-off valves, switches, and sources;

- appropriate responses to over exposure of themselves or other employees to health hazards or injury; and
- recognition of symptoms which may result from over exposure.

19.3 Personnel Roles and Lines of Authority

Implementation of emergency response procedures will be based on the information available at the time of the emergency. The Project Manager is responsible for the overall emergency response operations. The PM will be closely assisted by the site Health and Safety Officer and the Site Manager. Both the Site Manager and the Health and Safety Officer will evaluate the incident and the site response capabilities, and proceed with the steps to implement an appropriate response. Possible actions may involve evacuation of personnel from the site area.

The PM or is responsible for ensuring that corrective measures have been implemented, appropriate authorities notified, and follow-up reports completed.

All site personnel are responsible for assisting the PM or site Health and Safety Officer during the response within the parameters of their scope of work.

19.4 Communications

Primary emergency response communication shall be a telephone, cellular phone, or two-way radio. Primary means of communication will be established daily before work activities begin. An operational test will be conducted daily, before work begins, to make sure that the equipment is in proper working order and is not interfering with frequencies of nearby activities or nearby communications. The primary means of communication will be discussed during the daily safety briefing.

A secondary means of communication must also be established daily and communicated to site personnel during the daily briefing. Secondary or backup communications can include a cellular phone or a two-way radio other than those used for primary purposes.

19.5 Emergency Procedures

General

All incidents will be dealt with in a manner to minimize adverse health risk to site workers. In the event an incident occurs, the following procedures will be followed:

1. First Aid or other appropriate initial action will be administered by properly trained personnel who are closest to the incident. This assistance will be conducted in a manner to ensure that those rendering assistance are not placed in a situation of unacceptable risk.
2. All incidents will be reported to the PM or site Health and Safety Officer. The PM is responsible for coordinating the emergency response in an efficient, rapid, and safe manner.
3. All personnel on site are responsible for conducting themselves in a mature, calm manner during an incident. All personnel must conduct themselves in a manner that avoids spreading the danger to themselves, other personnel on site, and the public.

19.6 Fire or Explosion

Localized Fire

1. workers will immediately summon help.
2. the appropriate fire extinguisher shall be used to bring the occurrence under control.

3. as necessary and feasible, surrounding soil, a fire blanket, or other inert materials shall be placed on the burning area to extinguish the flames and minimize the potential for spreading.
4. the Fire Department will be notified.

Uncontrolled Fires

1. dial 911 or the Fire Department.
2. immediately evacuate the area and stand clear of the area and the path of responders.
3. evacuate upwind to avoid smoke and chemical exposure;
4. contractor supervisors are responsible for accounting for their personnel

19.7 Worker Injury or Illness

The procedures for responding to a worker injury or illness depend on the severity of the worker's condition. Medical response may need to be sought. The types of injuries and illnesses are varied, and shall be treated accordingly. These procedures do not specify the method of treatment, rather the First Aid measures to assist an injured worker before further treatment, if necessary.

- NOTE -

Treatment of life-threatening injuries is the number one priority. In these situations, decontamination procedures are always a secondary concern. Where radiation contamination is a factor, a life-threatening injury outweighs radiological control considerations.

The following steps must be taken in the event of a serious injury or illness to an employee occurs:

1. call for medical assistance.
2. No immediate danger - If the area presents no immediate danger, standard First Aid care should be given to the victim at the scene. The First Aid provider will provide care without further injuring or endangering the victim. **Moving the victim can make injuries worse.** If contamination does not present an immediate danger, the victim should not be moved. An evaluation may be made when emergency medical help arrives.
3. Immediate danger - If the area presents an immediate danger, the victim should be moved. Examples include fire, lack of oxygen, serious traffic hazard, risk of explosion, collapsing material or electrical hazards. Victims shall be moved using American Red Cross procedures. Persons trained in First Aid and CPR should direct those not trained.
4. Treating and decontamination - when an injured person is contaminated, a decision will be made required to give priority to the First Aid actions or decontamination. The priority decision will be made by the PM or site Health and Safety Officer. When the situation is life threatening (immediate danger), the victim should be removed from the area without being decontaminated.
5. Decontamination - If decontamination is necessary, follow the procedures in Section 10 of this plan. If the victim is contaminated and is transported to a medical facility, the receiving medical facility must be notified ahead of the victim's arrival.

Chemical Burns

Chemical burns occur when chemicals contact the eyes and/or skin of workers. If this occurs, perform Red Cross First Aid procedures, including the following:

1. call for medical assistance.
2. flush the area immediately with large amounts of water; **flush for 15-30 minutes.**
3. for chemicals in the eyes, lift the lower and upper lids frequently while flushing the eyes.
4. remove any affected clothing or jewelry.
5. treat for shock, as necessary.

19.8 Chemical Releases

The presence of chemicals on site will be minimal. However, if a chemical release occurs (liquid, solid, or gas), site personnel will stop work, evacuate the work area, and notify the Site Manager, Project Manager, or site Health and Safety Officer. Workers will not return to the area until the release has been contained, and the area is approved by the site Health and Safety Officer as safe to resume work.

Responses to major chemical releases will be performed by highly trained personnel through a mobile, on-truck servicing company. Responses to incidental releases will be determined by the site Health and Safety Officer. Workers are not expected to perform chemical emergency response; however, they can perform measures to prevent the spreading of the material. For incidental releases, workers will:

1. summon help
2. attempt to identify the release from a safe distance
3. use spill containment equipment (absorbent, pigs, booms) as appropriate to the release and personal safety
4. inspect containers to assure their integrity before being moved

5. minimize container movement
6. use only DOT approved containers to remove released material from the site,
7. containers that cannot be moved without failure shall be emptied into a sound container.

Spilled material and contaminated containment materials will be placed in designated containers, inventoried, labeled, and properly stored and managed. Containerized PPE will be characterized and managed at a RCRA Subtitle C facility.

If spilled material shows radioactive contamination above acceptable limits, it will be disposed of as commingled waste in an appropriate manner to be determined at a later date. If the field analysis shows no evidence of chemical contamination, and does not field test for radiation contamination above limits, the spilled materials can be disposed as solid waste.

19.9 Severe Weather Events

Severe weather events, including tornados, high winds, heavy rains, hail, lightning and snowstorms may arrive at the site with little or no warning. In case of certain severe weather events, such as large snowstorms, the Site Manager will be consulted to determine if work will need to be stopped early in order for employees to leave for their homes. Workers will be instructed by the Site Manager at the daily briefing regarding where to take cover if such an event occurs.

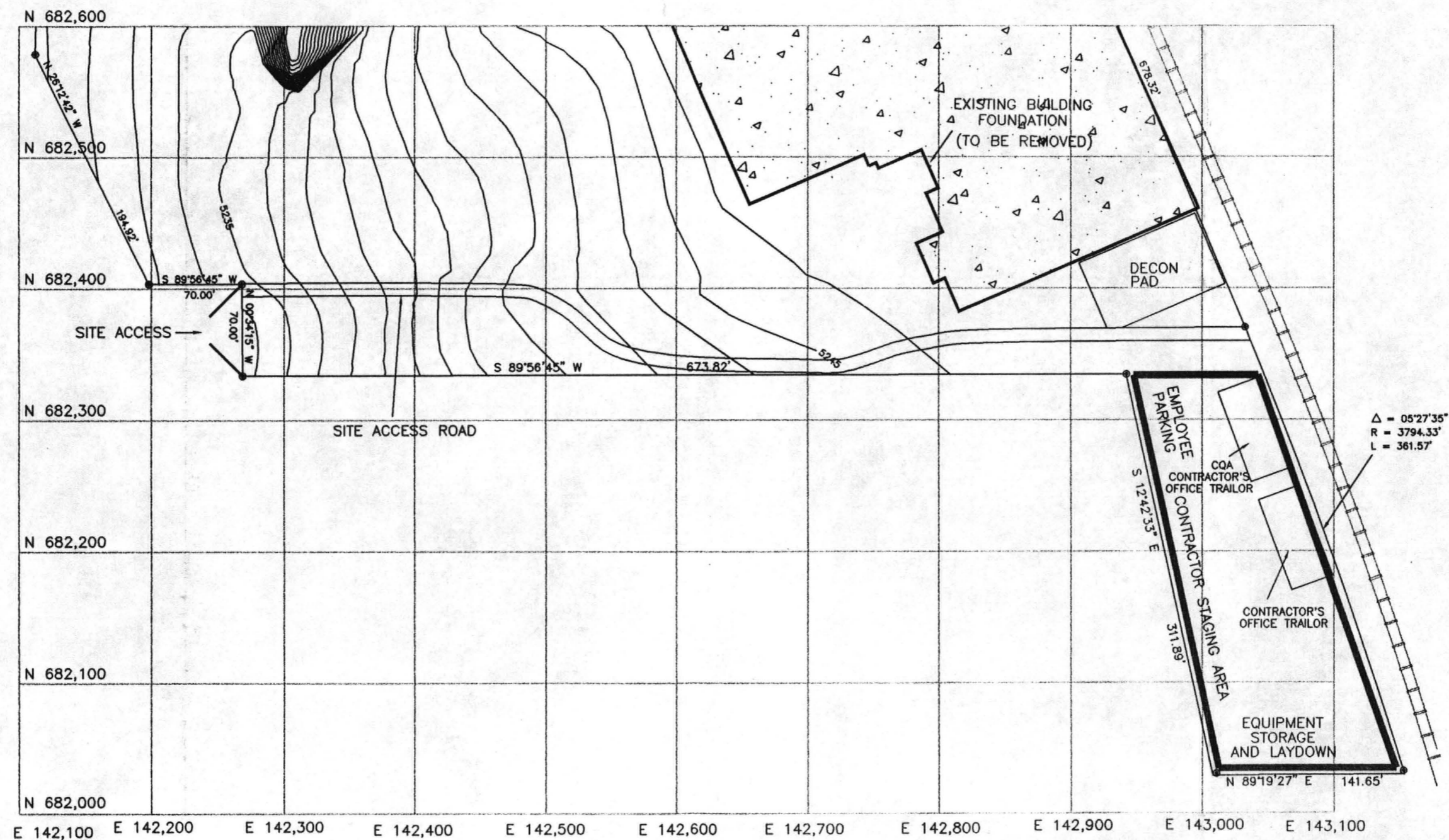
Although the ROBCO site is not considered in the 100-year flood plain, flooding or flash-flooding could occur. Should this unlikely event occur, all personnel shall assemble at the southeast corner of the ROBCO site (the highest point from the Platte River). If a site evacuation is necessary, an account of all persons should be made before leaving the site. Contractor supervisors are responsible for accounting for their personnel. Contractor supervisors will report to the site Health and Safety Officer regarding employee accountability.

19.10 Security

If a security breach of unauthorized persons occurs, workers shall notify the Site Manager immediately. The Site Manager will inform the person(s) that the site is for authorized personnel, and ask the person(s) to leave the site. If the person(s) refuse to leave the site, the Site Manager shall call for police assistance, and work areas may be temporarily shut down as needed.

Any other security issues, such as (but not limited to) bomb threats, violence, harassment, or potential physical harm to site workers by unauthorized persons shall be immediately addressed by the Site Manager or site Health and Safety Officer.

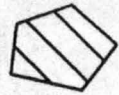
APPENDIX A



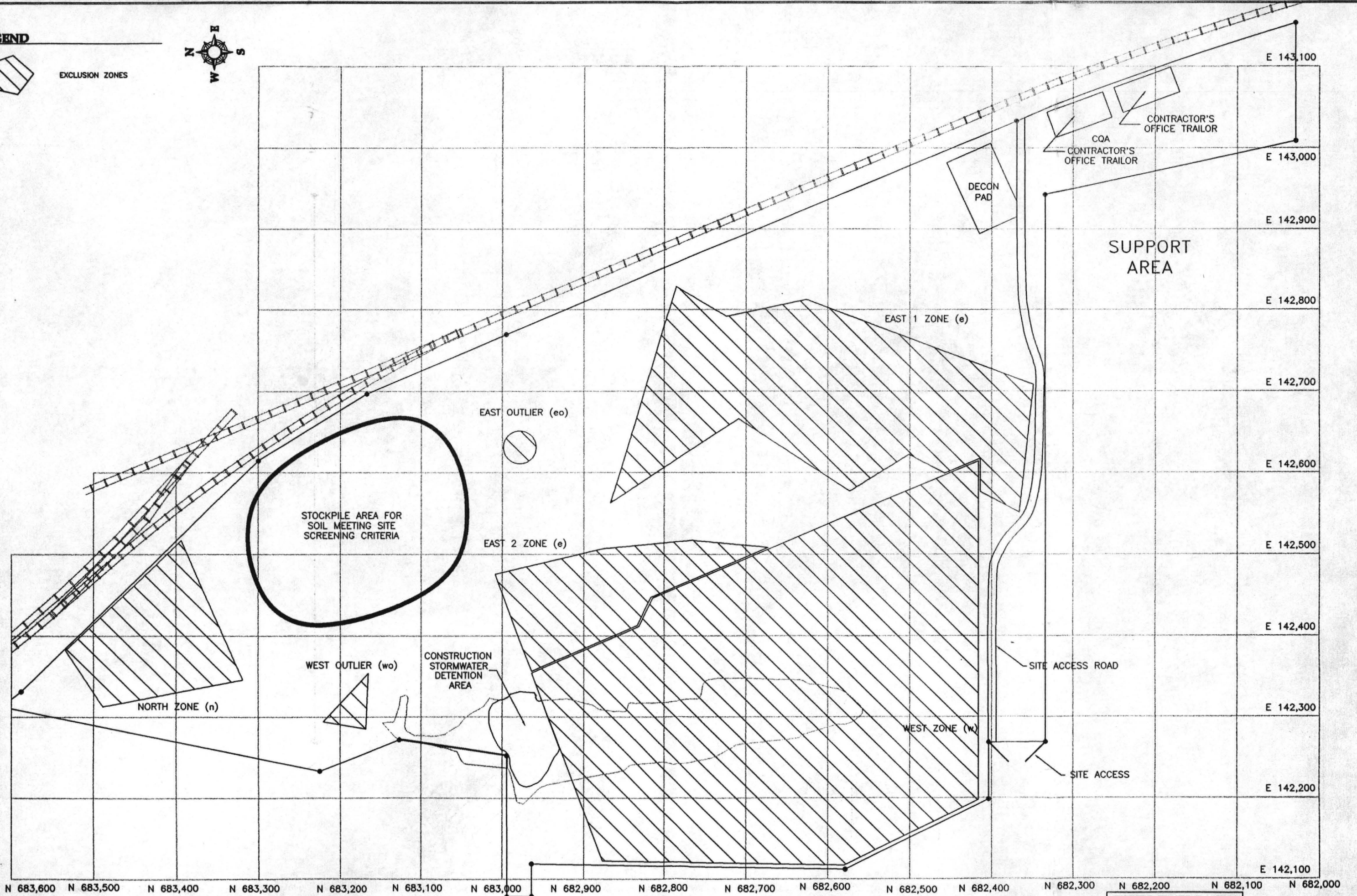
PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS	
NO.	DESCRIPTION
1	ISSUED FOR BIDDING
DATE: 08/27/98	
DRAWN BY: KAS/BAU	
CHECKED BY: BAC	
DATE: 08/27/98	
FOR NO. 000016	
DRAWING NO. FIGURE 1	
PROJECT: BOBOCO, DRIVE, COLORADO	
PHASE: PRELIMINARY RESPONSE ACTION	
CONTRACTOR STAGING AREA	
ERMA Rocky Mountain, Inc. 200 South Willow Drive Suite 200 Colorado Springs, Colorado 80915-8244 Group 142.000	
ERM	

LEGEND



EXCLUSION ZONES



PRELIMINARY
NOT FOR CONSTRUCTION

DATE	12/7/95
BY	W. J. BROWN
FOR	W. J. BROWN
PROJECT	ROBO SITE, DENVER, COLORADO
PROJECT NO.	98001.9
FIGURE NO.	FIGURE 2
<p>ERM Rocky Mountain, Inc. 1800 South Wadsworth Drive Suite 200 Colorado Springs, Colorado 80903-2000 719/575-1000</p>	
<p>ROBO SITE CONTROL AREAS</p>	